SCIENCE ABSTRACTS.

INDEX TO VOL. XXI.

1918.

SECTION A.—PHYSICS.

Price 1s. 6d. or 40 cents net.

(Free to Annual Subscribers.)

LONDON:
E. & F. N. SPON, LTD., 57, HAYMARKET, S.W.

NEW YORK:
SPON & CHAMBERLAIN, 123, LIBERTY STREET.

NAME INDEX.

SECTION A.—PHYSICS.

[*Names not followed by Titles are not Authors, but only names mentioned in Abstracts. The numbers refer to Abstracts; if the letter B follows a number the Abstract will be found in Section B under that number. An asterisk indicates remarks in a discussion.*]

Abbe, 29, 1083
Abbot, C. G., 348; earth's temperature, 736; solar variation, 1061
Abney, W. de W., 836; night-blindness, 674
Abney, W. de W., & S. W. J. Smith, colour vision, 156
Abraham, 142, 1110, 1217
Adams, 345
Adams, L. H., 54
Adams, W. S., 41, 646, 1069, 1074, 1075, 1077
Adams, W. S., & A. H. Joy, Cepheid variables, 1073; Mira Ceti, 1068; star luminosities, 350
Adams, W. S., A. H. Joy, & G. F. Paddock, Nova Aquilæ, 1230
Adams, W. S., & H. Shapley, S. U. Cassiopeiæ, 640
Adams, W. S., & G. Strömberg, binary star, 1052; star magnitudes, 1076
Adeney, W. E., & H. G. Becker, water re-aeration, 1202
Afanassjewa, Ehrenfest-, [Mrs.] T., thermodynamics, 855
Airey, J. R., electric waves, 696
Aitken, J., meteorology, 461
Aitken, R. G., Sirius, 1235; star orbit, 1228
Albrecht, 484, 755, 1236
Aldrich, L. B., 348
d'Alembert, 911
Alexander, L. M., & L. T. More, kathode rays, 1116
Alger, P. L., & A. E. Kennelly, flux distribution, 1188
Allcutt, C. T., current standard, 562
Allen, A. O., telescope lenses, 754
Allen, H. S., 1141; atomic frequency, 227; atomic number, 226, 228; cohesion, 899*; entropy, 962; molecular frequency, 458, 615, 730; spectral series, 523
Allen, [Miss] N. C. B., β-rays, 1103
Allen, R. G., electrical porcelain, 620B
Allievi, L., 601
Alter, D., stellar evolution, 480; wave velocity, 1146
Alterthum, 227
Amagat, 853, 966, 1176
Amerio, 288
Ampère, 184, 396
Anderegg, F. O., ozone formation, 205
Anderson, A., 360; conducting spheres, 399; electrostatics, 698; Huyghens' Principle, 1152
Anderson, C. O., & W. H. Coghill, ore flotation, 708
Anderson, R. J., metallography, 1133; titanium, 713
Andrade, 69, 167, 1259
Andrews, W. S., u.v. light source, 47
Angebaud, projectile localisation, 418
Ångström, 1031
Ångström, A., & H. Pettersson, hydrometer, 1
Ångström, K., 879
Antonoff, 847
Aoki, T., & M. Chikashige, system Al-Se, 578
Appell, P., absolute motion, 901; projectile trajectory, 328, 1025
Archbutt, S. L., 118
Arctowski, H., magnetic storms, 201
Argelander, 498, 1070
Arlès, E., Clausius' equation, 390; critical constants, 546; vapour pressure, 545, 692, 693, 853, 964, 1174, 1175, 1177
Arldt, T., 222
"Armco," 425
Armellini, G., 13
Arndt, M., M. Görcke, & J. Stark, canal-rays, 532

Arnold, 98
Aronberg, L., Bi spectrum, 676; Pb spectrum, 678
Aronberg, L., & W. D. Harkins, spectra, 271
Arrhenius, 881
Ashworth, J. R., 564
Ashworth, J. R., & E[va] Bruins, magnetic hysteresis, 109
Aston, F. W., 309
Aten, A. H. W., passivity, 814, 882; sulphur molecule, 874
Atwood, 443
Aubert, M., optics, 264
Ault, J. P., meteorology, 236
Aurén, T. E., 1162
Auric, sun's contraction, 1225

Babcock, H. D., & C. E. St. John, iron arc, 64
Babochine, A. L., cementite, 122
Backhouse, T. W., α Orionis, 498; star colours, 1234
Bär, R., electronic charge, 1263; nature of electricity, 971
v. Baeyer, 676
v. Bahr [Eva], 1150
Baker, F. S., snow evaporation, 1032
Baker, W. C., condensation pump, 215
Bakker, G., capillarity, 613
Balmer, 523, 838, 839, 1157, 1250, 1251
Bancroft, 345
Bancroft, W. D., adsorption, 865; Brownian motion, 609; catalysis, 127, 590, 591, 809; combustion, 1106; fog, 875; resistivity, 1119*; Zn electrode, 1006
Banerji, S., Foucault's test, 1154; sound, 781
Barkhausen, 90
Barkla, C. G., 166, 529, 682, 1259; X-rays, 165
Barkla, C. G., & M[argaret] P. White, X-rays, 166
Barling, W. H., 818
Barling, W. H., & H. A. Webb, elasticity, 889
Barnard, E. E., 149, 250, 1072; 40-in. refractor, 511
Barnett, S. J., 290, 412; electromagnetics, 547, 1180
Barton, E. H., 138
Barton, E. H., & H. M[ary] Browning, vibrations, 305, 894, 1140
Barus, C., 875; achromatic fringes, 832; elasticity, 218; interference, 833; interferometry, 57, 262
Barus, C., & M. Barus, electromagnetics, 786
Barus, M., & C. Barus, electromagnetics, 786
Bas, G. Le, volume curves, 421
Basu, N., 925; diffraction, 363
Basu, S. N., & M. N. Saha, state equation, 1173
Bateman, H., electromagnetics, 183, 974, 975; sound ranging, 856
Bates, 433
Baudin, 279
Bauer, 288, 993
Bauer, H., gravitational field, 824
Bauer, O., 316
Bauer, O., & O. Vogel, Al-Zn alloys, 1
de la Baume Pluvinel, A., astronomy, 11
Baumstark, Struve-, 1203
Bausch & Lomb Optical Co., 574
Bauschinger, 29
Baxandall, F. E., 347; stellar spectra, 1236
Bazzoni, C. B., 191
Beatty, R. T., 269
Beaulard, F., spark resistance, 792
Beck, K., magnetisation, 305
Becker, H. G., & W. E. Adeney, water re-aeration, 1202
Becker, L., nebula, 34; pole stars, 37
Beckman, B., conductivity, 100; Hall effect, 565
Beckmann, 956
Becquerel, 113
Bel, J. A. Le, cosmic system, 1079
Bellamy, E[thel] F., Nova Ritchey, 508
Bellis, A. E., tempering steel, 428
Belot, E., lunar volcanoes, 19; novæ, 1056; planet distances, 13; solar system, 830; stellar systems, 152
Beltrami, 900
van Bemmelen, W., meteorology, 1028
Benade, J. M., & K. T. Compton, electron collisions, 553
Benedicks, C., 102, 119, 969, 1272; thermoelectrics, 106, 984
Benedict, [Miss] E., & H. Senftleben, optics of carbon, 513
Benford, F. A., Jr., photometric hemisphere, 878B
Bennett, H. S., H. L. Pierson, & T. R. Briggs, endosmose, 880
Benoist, 266, 308
Benoit, 955
Benson, D. E., W. B. Ferguson, & F. F. Renwick, photometer, 920
Bergholm, C., double refraction, 61, 775
Bergman, A., illuminating shells, 930
Bergmann, 612
Bergstrand, O., 148
Berlowitz, M., micromanometers, 217
Bernacchi, L. C., 661
Bernard, V., & A. Portevin, macro-structure of steel, 878
Berndt, G., hardness, 888
Bernoulli, 962
Berthelot, 966
Berthelot, D., photo-chemistry, 435

Berthoud, 1174
Bertrand, 1214
Besant, 5
Bessel, 1065
Bethenod, J., oscillating circuit, 979
Beyling, 1171, 1262
v. Bichowsky, F. R., colour of compounds, 812 ; Planck's law, 387
Bickley, W. G., liquid motion, 821 ; potential problems, 1021
Bidwell, C. C., thermoelectrics, 300
Bidwell, S., 1271
Bigelow, S. L., & C. S. Robinson, osmotic pressure, 806, 807
van der Bijl, H. J., 552 ; spectra, 161 ; thermionic amplifier, 1267
Bilham, E. G., water-level in well, 235, 918
Bilt, J. Van Der, 33
Bilt, J. Van Der, & H. Shapley, W Ursæ Majoris, 351
Bingham, 543
Birge, 238
Birge, R. T., band series, 525
Biscoe, F., 632 ; sun's temperature, 348
Bishop, 552
Bjerrum, N., 286, 935
Björnstahl, Y., anisotropic liquids, 924
Blaauw, A. H., & [Miss] H. J. Folmer, radio-activity, 685
Blair, T. A., meteorology, 622
Blake, F. C., 1163 ; X-ray analysis, 1255
Blake, F. C., & W. Duane, *h* determination, 291 ; X-rays, 272
Blake, F. C., & B. H. Jackson, Lecher system, 1270
Blanc, P., Nova Aquilæ, 1066
Blanchard, J., retinal sensibility, 667
Bloch, L., gravitation, 453
Block, W., hydrometers, 1012
Blom, 227
Blondel, A., detecting diplopia, 1240
Blount, B., chemical balance, 4
Blount, B., & W. H. Woodcock, vacuum balance, 214
Bock, H., elasticity, 1107
Bodenstein, 809, 879
Boericke, 438
Bogitch, B., & H. le Chatelier, steel heterogeneity, 1280
Bohlin, Hansen-, 490
Bohr, 161, 167, 229, 291, 520, 523, 566, 611, 941, 1090, 1110, 1215
Bohr, N., 136, 271, 522, 530, 612, 678, 1108, 1216
du Bois, H., medical electromagnet, 995
Bolliger, A., potential theory, 293
Bolton, 373
Bolton, S., Jupiter, 1047
Boltwood, 309
Boltzmann, 80, 84, 177, 854
Boltzmann, Stefan-, 73, 86, 1214
Bonnerot, S., & G. Charpy, steel heterogeneity, 315, 712
Bonsdorff, 752
Booge, J. E., & J. Kendall, ionisation, 320
Bordier, H., radiotherapeutic unit, 1196
Borelius, 107
Borelius, G., alloy analysis, 430 ; thermoelectrics, 1188
Borelius, G., & A. E. Lindh, Hall-effect, 107
Born, M., 1089 ; electromagnetics, 1109 ; ionic charge, 972 ; optical activity, 934
Bosler, J., meteorites, 499 ; Nova Aquilæ, 1066
Boss, 22, 1065, 1229
Boss, B., star motions, 1074
Bourget, H., starlight, 1057
Bousfield, W. R., iso-piestic solutions, 1130 ; osmotic pressure, 318
Bouthillon, L., radio transmission, 758
Bouty, 794
Bowen, N. L., glassy magmas, 467
Boyle-Charles, 80
Bradley, 966
Bragg, 168, 380, 382, 682, 844, 949, 950
Bragg, J. G., & J. H. Griffith, bridge columns, 1018
Bragg, W. H., 842, 892, 1162
Bragg, W. L., 842, 892, 1098
Braham, J. M., & D. A. MacInnes, calorimeter, 174
Brainin, C. S., X-rays, 163
Branly, E., mica's conductivity, 104, 105
Brann, A., & O. P. Watts, plating solutions, 722
Braun, 980
Bray, W. C., 434
Brazier, C. E., wind variation, 620
Brentano, J., X-ray spectra, 269
Brester, A., solar theory, 15
Breymesser, H., & R. Kremann, electrolysis, 592
Bridgman, P. W., elasticity, 596 ; thermoelectrics, 558
Briggs, C. A., W. C. Chapin, and H. G. Heil, elasticity, 887
Briggs, T. R., H. S. Bennett, & H. L. Pierson, endosmose, 880
Brightmore, A. W., earth pressures, 828*
Brighton, 811
Brighton, T. B., R. L. Sebastian, & G. N. Lewis, hydrogen electrode, 321
Brillouin, M., electromagnetics, 87, 973
Brinell, 219, 424, 817, 886, 888
Briner, E., nitrogen oxides, 1005
Brodetsky, S., parachute's stability, 1139
van den Broek, 1250

van den Broek, J. A., cold-working, 1282
de Broglie, M., X-ray spectra, 268; X-rays, 270
Bromwich, T. J. I'A, 195
Brooke, W. J., & F. F. Hunting, "Armco" iron, 425
Brooks, C. F., scarf clouds, 1029; snowfall, 344
Brown, 230, 459, 609, 614, 970
Brown, E. W., 147
Brown, H. T., diffusion, 893
Brown, T. B., fluorescence, 379
Browning, H. M[ary], 138
Browning, H. M[ary], & E. H. Barton, vibrations, 335, 894, 1140
Brownlee, R. B., & F. G. Keyes, vapour pressure, 282
Bruins, E[va], J. R. Ashworth, magnetic hysteresis, 109
Brunelli, P. E., vapour pressure, 385
Brunetti, 840, 942, 1157
Brunetti, R[ita], h.f. spectra, 159
Brush, C. F., 363
Brush, C. F., calorescence in steel, 586
de Bruyn, C. A. L., & A. Smits, Ni potential, 440
Bucherer, 684, 820, 1103
Buchheim, W., & H. Dember, atmo-electrics, 189
Buckingham, F., & W. C. Unwin, hardness, 817
Budde, E., sound-beats, 858
Buisson, H., sensation of light, 1243; visible radiation, 359
Bunsen, 176
Burdick, C. L., & J. H. Ellis, crystal structure, 168
Burger, H. C., Brownian motions, 459
Burgers, J. M., spectrum, 286; thermodynamics, 284
Burgers, J. M., H. K. Onnes, & P. G. Cath, thermometry, 961
Burgess, 386
Burzio, F., ballistics, 133
Butterworth, 1120

Cable, [Mrs.] R., & H. Schlundt, Ra extraction, 1104
Cady, F. E., W. E. Forsythe, & E. P. Hyde, colour temperature, 73; radiation visibility, 929
Cailler, C., relativity, 140
Cailletet, 853
Campbell, 95
Campbell, E. D., resistivity, 1119
Campbell, E. D., & W. C. Dowd, steel resistivity, 197
Campbell, W. W., 41, 487, 641, 756, 1077
Cannon, [Miss], 1229
Cannon, J. B., lightning spectrum, 680
Capon, 746
Carnot, 289, 1178
Carpenter, F. A., whirlwind, 1036
Carpenter, H. C. H., 716; mild steel, 207*
Carrière, Z., 328, 1025; air-resistance, 224
Carrington, H., & W. C. Popplewell, strut failure, 818
Carter, R. B., spectra, 55
Case, T. W., cuprous-oxide cell, 1007
Cassini, 245
Caswell, A. E., Thomson-effect, 1275
Caswell, A. E., & C. A. McKay, Peltier-effect, 1274
Cath, P. G., C. A. Crommelin, & H. K. Onnes, critical points, 285
Cath, P. G., & H. K. Onnes, vapour pressures, 957, 959
Cath, P. G., H. K. Onnes, & M. Burgess, thermometry, 961
Cauchy-Poissin, 468
Cermak, P., organ pipes, 182
Chadwick, J., 68
Chalmers, S. D., optical system, 672
Chamberlin, 222
Chandler, 660, 1038
Channon, H. J., F. F. Renwick, & B. V. Storr, scattering media, 665
Chant, C. A., W Virginis, 660
Chaperon, 467
Chapin, W. C., H. G. Heil, & C. A. Briggs, elasticity, 887
Chapman, 761, 1237
Chapman, S., 687; earth's magnetism, 567; magnetic declination, 115; magnetic storms, 993; star numbers, 353
Chappuis, 357
Charles, Boyle-, 80
Charlier, C. V. L., 1067, 1239; stellar universe, 36
Charpy, G., 316, 424; forging steel, 1001
Charpy, G., & S. Bonnerot, steel heterogeneity, 315, 712
Charpy, G., & A. Cornu-Thenard, shock tests, 129
le Chatelier, H., 102, 121, 125, 176, 177, 315, 316, 690, 712, 878, 1262
le Chatelier, H., & B. Bogitch, steel heterogeneity, 1280
le Chatelier, H., & E. L. Dupuy, steel heterogeneity, 317, 711
Chatley, H., cohesion, 899
Chaudari, T. C., liquid crystals, 1199
Chaumat, H., excess-voltage effect, 404B
Chaundy, T., optical aberrations, 53
Chauveau, A. B., atmo-electrics, 190
Chavanne, 299
Chéneveau, C., C. Géneau, & R. Hadfield, Mn steels, 111

Cheney, W. L., 1186 ; thermionics, 95
Chevenard, P., 871 ; cementite, 587 ; dilatometer, 536 ; tempering steels, 877
Chikashige, M., & T. Aoki, system : Al-Se, 578
Chikashige, M., & M. Fujita, system : Se-Sb, 580
Chikashige, M., & R. Hikosaka, system : Cd-Se, 579
Chikashige, M., & R. Kurosawa, system : Zn-Se, 576
Chikashige, M., & J. Nosé, system : Te-Al, 577
Chinmayam, T. K., radiation theory, 160
Chinmayanandam, T. K., diffraction, 925
Chow, M., & A. A. Noyes, chloride electrodes, 1136
Chree, C., 661 ; magnetic storm, 306, 1195
Churchill, J. C., W. R. Ham, & H. M. Ryder, vapour pressures, 963
Cisotti, 200
Civita, Levi-, 606, 908
Clarke, F. W., isotopic lead, 1101
Clausius, 177, 390, 545
Clayton, H. H., solar radiation, 6
Clennel, J. E., 210
Cloup, F., quenched steel, 588
Coblentz, W. W., 288 ; "black body" radiation, 72
Coblentz, W. W., & W. B. Emerson, colour sensibility, 155 ; photo-electrics, 93 ; reflecting power, 1156
Coblentz, W. W., W. B. Emerson, & M. B. Long, light transmission, 1149
Coehn, 879
Coghill, W. H., & C. O. Anderson, ore flotation, 708
Cohen, E., 206 ; allotropy of Cd, 1000
Cohen, L., 795
Compton, 191
Compton, A. H., electron, 549, 784 ; structure of solids, 892 ; X-ray spectrum, 1098
Compton, A. H., & O. Rognley, magnetic theory, 566
Compton, K. T., 566
Compton, K. T., & J. M. Benade, electron collisions, 553
Comstock, G. C., 50 ; binary star, 509
Conrad, F., radiation efficiencies, 670
Conrad, W. A., clock rates, 2
Conrady, A. E., eyepieces, 753
Conway, A. W., point-potential, 1113
Cook, S., 5
Cooksey, C. D., 1098
Cooksey, C. D., & H. S. Uhler, Ga spectrum, 267
Coolidge, 164, 977, 982, 983, 997, 1125
Coolidge, W. D., X-ray tube, 415
Coolidge, W. D., & C. N. Moore, X-ray outfit, 572
Coradi, 326
Corbino, O. M., 977 ; spark coil, 976 ; 3-phase rectifier, 861B
Corbino, O. M., & G. C. Trabacchi, spark coil, 1124
Cornu-Thenard, A., & G. Charp shock tests, 129
Cortie, A. L., coronal spectrum, 748 Nova Aquilæ, 1066
"Cottingham," 1208
Coudres, Des, 992
Coursey, P. R., capacity of solenoids, 795
Coward, H. F., 76
Cowell, 17
Cowley, W. L., & H. Levy, loaded struts, 890
Cozza, R., hypsometer, 1207
Crandall, I. B., condenser transmitter, 1121
Cranston, J. A., & F. Soddy, actinium, 847
Crapper, E. H., magneto-magnets, 850B
Crawford, W. W., vacuum pump, 128
Crehore, A. C., crystal structure, 229 ; electro-magnetics, 1108 ; revolving electrons, 1215
Crémieu, V., gravitation, 131, 132
Crittenden, E. C., 259
Crommelin, A. C. D., 1172 ; galactic coordinates, 494 ; spiral nebulæ, 655 ; stellar parallax, 654
Crommelin, C. A., P. G. Cath, & H. K. Onnes, critical points, 285
Crooker, S. J., d.c. corona, 703
Crookes, 866
Crookes, W., meteorite spectra, 489
Crosthwaite, P. M., earth pressures, 828
Cumberbatch, E. P., diathermy, 996
Cunningham, E., 919, 974
Cunningham, Stokes-, 141, 188, 1211
Curie, 798, 871, 991, 1192
Curie, P., 109
Curie, Mme. S., 951
Curtis, H. D., nebulæ, 478 ; novæ, 27

Dalby, W. E., extensometer, 447 ; mild steel, 207
Dale, [Miss] A. B., & T. Smith, objectives, 257
Darby, E. H., conductance, 434
Darling, C. R., & A. W. Grace, thermo-electrics, 301
Darwin, 10, 241, 830
Dausset, 571
Davey, W. P., emulsions, 575
Davies, E. C. H., grinding glass tips, 726
Davis, B., 552 ; X-rays, 1097

Davis, H[elen], variable star, 652
Davis, W. M., isostatic subsidence, 10
Davisson, 549
Debye, 82, 169, 226, 227, 284, 520, 1105, 1273
Debye, P., 70, 381, 382, 497, 843, 1090, 1110; atomic structure, 169; light-absorption, 496
Deeley, R. M., cyclones, 460
Deissard, L., 1045
Dejean, P., 877; martensite, 121
Delaunay, 639
De Luca, U., & M. La Rosa, Hall-effect, 1278
De Lury, R. E., spectro-comparator, 44
Demarçay, 677
Dember, H., 701
Dember, H., & W. Buchheim, atmo-electrics, 189
Dember, H., & M. Uibe, sky's form, 1147
Dempster, A. J., positive-ray analysis, 788
Denning, W. F., Nova Aquilæ, 1066
Dennis, L. M., & A. B. Ray, electrolysis, 322
Derieux, J. B., Millikan's experiment, 454; photoelectrics, 787
Dershem, E., X-ray spectrum, 845
Des Coudres, 992
Deslandres, H., 1091
Desplats, R., & R. Wickham, radiology, 571
Devereaux, W. C., meteorology, 337
Dickinson, H. C., 174, 432
Diesselhorst, 557
Dieterici, C., earth's magnetism, 114
Dimmer, G., boiling-point apparatus, 848
Dines, W. H., 460
Dixon, A. A., & A. L. Hughes, discharge, 191
Dixon, H. B., 76
Dixon, S. M., earth pressure, 828*
Doberek, 1072
Dodge, H. L., a.c. resonance, 870; elasticity, 727; rheostat design, 796
Dolezalek, 439
Domcke, 803
Doodson, A. T., G. Kennedy, & J. Proudman, electromagnetics, 195
Doppler, 50
Dorsey, N. E., radium in warfare, 1099*
Doubt, T. E., Talbot's bands, 62
Douglas, C. K. M., clouds, 464
Dowd, W. C., & E. D. Campbell, resistivity, 197
Drecq, 288
Dreyfus, L., hysteresis losses, 622B
Driesen, J., carbon steels, 316
Drossbach, 677
Drude, 514, 520, 969, 1243, 1274
Duane, W., 387, 1255
Duane, W., & F. C. Blake, *h* determination, 291; X-rays, 272
Duane, W., & K. F. Hu, X-rays, 1163; X-ray series, 1165
Duane, W., & T. Shimizu, X-rays, 1160
Dudding, B. P., 259
Dufay, L., photography, 153
Duhem, 809
Dulong, 892
Duncan, R. C., 514
Duncan, R. W., 514
Dunoyer, L., 374; wind variation, 620
Dunoyer, L., & G. Reboul, wind variation, 234
Dupuy, E. L., & H. le Chatelier, steel heterogeneity, 317, 711
Durrer, R., specific heats, 689
Dusen, M. S. Van, & N. S. Osborne, latent heat, 278; specific heat, 277
Dwight, H. B., skin-effect, 985
Dyson, F. W., 1065; latitude variation, 1038; Nova Aquilæ, 1066
Dyson, F. W. & W. G. Thackeray, star density, 22

Eastman, E. D., W. H. Rodebush & G. N. Lewis, specific heat, 540
Easton, C., Nova Aquilæ, 1066; winter temperatures, 913
Eddington, A. S., 135, 251, 470; gravitation, 17; matter theory, 919; relativity, 905; star's interior, 253
Eder, J. M., spectrum, 677
Edgeworth, F. Y., law of error, 816
Ediswan-Fleming, 259
Edwards, C. A., & F. W. Willis, hardness, 886
Edwards, J. D., gas interferometer, 54
Eggertz, 1127
Ehrenfest, P., 284, 854; Brownian motion, 614; dimensions of space, 136
Ehrenfest-Afanassjewa, [Mrs.] T., thermodynamics, 855
Ehrenhaft, F., 785, 971; electronic theory, 970; light-positive motions, 1085
Einstein, 16, 68, 82, 89, 134, 142, 144, 167, 227, 232, 247, 331, 333, 453, 529, 605, 614, 749, 825, 851, 879, 900, 910, 919, 1019, 1096, 1217
Einstein, A., 412, 449, 452, 457, 608, 729, 822, 907, 908, 1213; dynamics, 455; gravitation, 607, 728; gravitational waves, 606; relativity, 897, 906
Einstein-Lorentz, 1112
Einstein-Minkowski, 88
Ellerman, F., solar "bombs," 349
Ellerman, F., A. van Maanen, & F. H. Seares, sun's axis, 472

Ellerman, F., G. E. Hale, F. H. Seares, & A. van Maanen, sun's magnetism, 1078
Ellis, J. H., & C. L. Burdick, crystal structure, 168
Ellis, J. H., & A. A. Noyes, free energy of HCl, 811
Elmendorf, A., differentiating machine, 326
Elöd, 803
Elworthy, R. T., & J. Satterley, radio-activity, 1169
Emden, 194
Emerson, B. K., earth's deformation, 222
Emerson, W. B., & W. W. Coblentz, colour sensibility, 155; light transmission, 1149; photoelectrics, 93; reflection, 1156
English, S., & W. E. S. Turner, glass annealing, 422
Eotvös, V., 333
Epstein, P. S., 284; diffraction, 59; heat theory, 79; phase-space structure, 968
Ercolini, G., oil films, 1210
Erhardt, F., h.f. permeability, 706
Erskine-Murray, J., 326
Espy, 237, 620
v. Ettingshausen, 113
Euler, 616, 885
van Everdingen, 107
Evershed, 44
Ewald, P. P., crystal-optics, 950
Ewing, 200, 410
Exner, 372, 677, 937

Fabry, C., 1057; light scattering, 519; radiation, 83
Fabry-Perot, 261
Fairchild, C. O., F. L. Mohler, & P. D. Foote, pyrometer glass, 60
Fajans, 951
Faraday, 56, 88, 184, 972
Farr, C. C., magnetic survey, 570
Farwell, S. P., 98, 703
Fath, E. A., nebulæ, 751
Faxén, H., reflected X-rays, 843
Fechner, 667
Fechtchenko-Tchopovsky, S. A., iron cementation, 120
Federhofer, K., thermodynamics, 287
Feely, R. J., & F. E. Hackett, Leclanché cell, 717
Fehrle, K., properties of elements, 1142
Fenner, C. N., glass-melting, 574
Ferguson, A., and N. Thomas, evaporation, 71
Ferguson, J. B., electric furnace, 1283
Ferguson, W. B., F. F. Renwick & D. E. Benson, photometer, 920
Fermat, 605, 900
Féry, 288, 715
Féry, C., lead accumulator, 324
Fick, 893
Fink, C. G., steel resistivity, 1119*
Finzi, 564
Fischer, E., 432
Fitzgerald, 919
Fizeau, 88, 89, 955
Flamm, L., electronic charge, 185; quanta theory, 851
Flamm, L., & H. Mache, combustion, 690
Fleming, 795
Fleming, J. A., 894
Fleming, Ediswan-, 259
Flint, 487
Föex, 871
Fokker, A. D., matter theory, 919
Folmer, [Miss] H. J., electrometer, 408
Folmer, [Miss] H. J., & A. H. Blaauw, radio-activity, 685
Foote, P. D., 1186; ammeter, 406; atomic number, 1141; grey radiation, 178; pyrheliometer, 1011
Foote, P. D., & F. L. Mohler, discharge, 1266
Foote, P. D., F. L. Mohler, & C. O. Fairchild, absorption glass, 60
Foote, P. D., & J. T. Tate, anode films, 193; ionisation potentials, 63, 378, 941
Foote, P. D., F. Wenner, & E. E. Weibel, e.m.f. measurement, 559
Forchheimer, P., ground-water movements, 628
Forman, A. H., 549
Forsythe, W. E., 675
Forsythe, W. E., F. E. Cady, & E. P. Hyde, colour temperature, 73
Forsythe, W. E., & C. P. Hyde, high-temperature scales, 541
Forsythe, W. E., E. P. Hyde, & F. E. Cady, radiation visibility, 929
Fotheringham, J. K., sun's acceleration, 747
Foucault, 673, 1154
Fourier, 893
Fowle, F. E., 348; light absorption, 1086
Fowler, 1251
Fowler, A., Nova Aquilæ, 1066; solar spectrum, 936
Fowler, A., & C. C. L. Gregory, solar spectrum, 937
Fowler, A., & R. J. Strutt, ozone spectrum, 12
Franck, 552, 789
Franck, J., 161, 191, 789
Frank, P., aeronautics, 332
Frankenfield, H. C., tornadoes, 343
Frankland, 875
Franklin, W. S., & B. McNutt, electric waves, 697

Franks, 1234
Franz, Wiedemann-, 103, 405, 1190
Fraunhofer, 910
Freeman, H. M., and C. W. Waggoner, magnetisation, 409
Freundlich, E., *n*-bodies problem, 617
Frey, W., & A. Hagenbach, discharge, 192
Fritsche, 568
Frölich, 200
Fürth, R., Brownian motions, 230; surface tension, 618
Fuess, 1013
Fujita, M., & M. Chikashige, system: Se-Sb, 580

Gaede, 1170
Gaertner, 654
Gans, 200, 798
Garrett, A. E., 1184
Garrigou-Lagrange, P., atmospheric movements, 1222
Garvin, 877
Garvin & P. Portevin, quenched metals, 119
Gauss, 136, 453, 569
Gehrcke, 676
Geibel, 430
Geissler, 297
Géneau, C., C. Chéneveau, & R. Hadfield, Mn steels, 111
Gerber, P., 231
Gerlach, 288
Getman, F. H., 1000; allotropic Cd, 206; Pb electrode, 815
Ghosh, J. C., conductivity, 881
Gibbs, 387, 1006
Gibson, 962
Gibson, G. E., & G. N. Lewis, entropy, 177
Giltay, J. W., 859
Ginzel, F. K., comet, 1053
Gladstone, Newton-, 357
Glancy, [Miss] A. E., Aethra's orbit, 476; orbit determinations, 500; Polaris' parallax, 752
Glazebrook, R. T., research laboratory, 411B
Glocker, R., 1259; secondary radiation, 946; X-rays, 528
Gockel, A., ionisation of atmosphere, 701
Görcke, M., J. Stark, & M. Arndt, canal-rays, 532
Gooch, F. A., and W. Scott, electro-analysis, 1206
Gordon, N. T., & D. P. Smith, Cu-Ni alloys, 716
Goucher, F. S., 161, 191, 552
Gouy, G., 46, 289, 467, 542, 1116; discharge, 298
Grace, A. W., & C. R. Darling, thermo-electrics, 301
Graham, T. S. H., stellar velocities, 759
de Gramont, A., boron spectrum, 679
Ti spectrum, 370
Grandjean, F., step structure, 709
Grant, 309
Grant, W. K., nebulæ, 28
Gray, 309
Gray, A., 600; planetary motion, 477
Grayson, H. J., dividing engine, 212
Grebe, 936
Green, G., ship-waves, 902
Green, L., 222
Greenhill, G., 1025; ballistics, 597; Rankine waves, 731; spinning-top, 604; wave motion, 734; whirling shaft, 603
Gregg, W. R., meteorology, 1218; turning of winds, 623
Gregory, C. C. L., & A. Fowler, solar spectrum, 937
Greinacher, H., ionisation, 864; obtaining h.t. direct current, 405B; selenium rectifier, 561
Grenet, L., 316, 583; Cr steels, 710
Griffith, A. A., & G. I. Taylor, torsion, 221
Griffith, J. H., & J. G. Bragg, bridge columns, 1018
Griffiths, 226
Griggs, M[ary] A., J. L. R. Morgan, & A. J. Scarlett, Jr., mixed liquids, 436
Griggs, R. F., eruption, 1041
Grondahl, L. O., magneton, 108
Grover, F. W., inductance, 1120
Grüneisen, E., 100, 227; dilatation, 1105; resistivity, 1273
Gruner, P., twilight, 742
Guertler, 1272
Guest, J. J., beams, 1138
Gueugnon, 443
Guillaume, C. E., 871; length standards, 1014
Guilleminot, H., dosimetry, 307; fluorometric apparatus, 308; X-ray therapy, 416
Guillery, Brinell test, 219
Guillet, 583; gravity, 450
Guillet, A., moments of inertia, 891; mutual inductance, 987
Gumlich, 200, 564
Guye, C. E., 587
Gwyther, R. F., stresses, 819

Haas, A., gravitation, 1020
de Haas, W. J., 412; diffraction, 1155
Haber, 176, 715, 875
Hackett, F. E., & R. J. Feely, Leclanché cells, 717
Hackh, I. W. D., periodic system, 1197
Hadcock, A. G., ballistics, 896
Hadfield, R., C. Chéneveau, & C. Géneau, Mn steels, 111
Hafen, 293

Hagenbach, A. & W. Frey, discharge, 192
Hahn, O., & L. Meitner, prot-actinium, 951
Haigh, B. P., fatigue of brasses, 581
Haines, W. B., 789, 863
Hale, G. E., solar spectrum, 347
Hale, G. E., F. H. Seares, A. van Maanen, & F. Ellerman, sun's magnetism, 1078
Hall, 113, 472, 883, 966, 1278
Hall, E. H., heat-conductivity, 849; Peltier-effect, 403; thermoelectrics 704. 868
Hall, M., hurricanes, 619
Hall, R. E., 802
Halm, J., star-counts, 658; star magnitudes, 657, 760, 761
Ham, W. R., J. C. Churchill, & H. M. Ryder, vapour pressures, 963
Hamburger, L., discharge, 793
Hamburger, L., & G. Holst, spectrophotometry, 778
Hamburger, L., & W. Reinders, metal films, 895
Hamilton, 453, 455, 477
Hamy, M., diffraction, 518, 635; solar images, 1046; star velocities, 1055
Hanriot, 446
Hansen, 767
Hansen-Bohlin, 490
Hanson, D., & J. L. Haughton, thermostat, 686
Hanzlik, S., meteorology, 743
Harcourt, 259
Hardtke, O., ionisation potentials, 1161; nitrogen spectrum, 1092
Hardtke, O., J. Stark, & G. Liebert, Stark-effect, 1251
Hargreaves, R., diffraction, 1248
Harkins, W. D., 802
Harkins, W. D., & L. Aronberg, spectra, 271
Harms, 1184
Harper, W. E., Nova Aquilæ, 1066; star orbits, 42
Harting, 1083
Hartley, 12
Hartmann, 516
Hartmann, A., lithium atom, 612
Hartmann, J., 774; star spectra, 497
Hartmann, L. W., radiation visibility, 666
Hartmann, P., & P. Oberhoffer, streaky iron, 123
Hartshorn, L., gas flow, 223
Haschek, 372, 677, 937
Hashimoto, M., 1037
Hasselberg, 372
Haudié, E., & M. Latour, reactive voltamperes, 117B
Haughton, J. L., & D. Hanson, thermostat, 686
Havelock, T. H., waves, 1145
Havward, C. R., & A. B. Johnston, X-ray therapy, 424
Heaps, C. W., Hall-effect, 112
Heath, R. F., Pt substitutes, 310
Heaviside, 975, 980
Hebb, 161
Hebb, T. C., ionisation potential, 552
Hecker, 146
Heil, H. G., C. A. Briggs, & W. C. Chapin, elasticity, 887
Heise, G. W., & J. R. Wright, radioactivity, 170
Helderman, 1000
Heller, 815
Hellmann, G., 237; mild winters, 739; nocturnal cooling, 1221; severe winters, 624
Helm, G., ether, 143
Helmholtz, 875, 1205, 1225
Helmick, P. S., photographic densities, 521; plate blackening, 836
Hemsalech, G. A., 162; coloured flames, 46; spectra, 1159
Henderson, 161, 941
Henderson, J. P., & A. F. Hunter, solar halo, 625
Henderson, W. E., & G. Stegeman, lead standard cell, 323
Henie, H., 1232
Henning, 384, 961
Henri, V., 938
Henroteau, F., β Canis Majoris, 1054 γ Orionis, 1226; κ Pegasi, 487 σ Scorpii, 1227
Henry, A. J., meteorology, 338
Hermann, L., 884
Hertz, 200, 552, 781, 887, 1161, 1216
Hertz, G., 161, 191
Hertz, H., 934
Hertzsprung, 148, 253, 1239
Herzfeld, K. F., normal potentials, 1205
Hess, V. F., & M. Kofler, penetrating radiation, 274
Hess, V. F., & W. Schmidt, radioactivity, 683
Hessenberg, 908
Hettner, G., hydrogen spectrum, 935; water-vapour spectrum, 939
Heurlinger, T., 107, 565; band spectra, 1091
Heuse, 544
Heusler, 412
Hewlett, C. W., radio-activity, 273
Heyn, 316
Hibbert, 907
Hicks, 523
Hikosaka, R., & M. Chikashige, system: Cd-Se, 579
Hilbert, 729
Hill, 256, 767
Hill, C. W., & G. P. Luckey, lead in copper, 1126

Hinde, E. E. T., gyroscopics, 600
Hinks, A. R., solar eclipse, 242
Hirayama, K., asteroid groups, 1050 ; asteroid motions, 475, 1051
Hirayama, S., solar atmosphere, 632 ; star distances, 1069
Hodgson, E. A., seismology, 1043
Hodgson, M. B., dry-plates, 51 ; X-ray sensitometry, 773
Holborn, L., 966 ; manometers, 725
Hollnagel, H. P., light absorption, 515
Holst, G., 793
Holst, G., & L. Hamburger, spectral intensities, 778
Holst, G., & A. N. Koopmans, discharge, 794
Holst, G., & J. S. de Visser, black body, 837
Holtsmark, J., 838 ; series spectra, 838
Holtz, 936
Honda, K., 241, 414, 872, 1191 ; cementite, 413 ; dilatation, 538 ; ferromagnetics, 1123 ; Fe transformations, 585 ; latent heat, 1261 ; magnetisation, 110 ; steel resistivity, 1190
Honda, K., & T. Murakami, tungsten steels, 876
Honda, K., & J. Ôkubo, ferromagnetics, 411 ; hysteresis, 410
Honda, K., & T. Simidu, conductivity, 405
Honda, K., & H. Takagi, Ni steels, 871
Hopkins, B. S., & L. F. Yntema, holmium, 1198
Hopkinson, 102
Hopkinson, B., 690
Horton, F., ionisation, 95
Hostetter, J. C., & R. B. Sosman, mercury still, 420
Howe, G. W. O., heterodyne amplification, 885B ; shunted telephone, 532B
Howe, H. M., 208 ; grain growth, 1003 ; gun erosion, 429
Howes, H. L., spectra, 373, 526
Howes, H. L., & E. L. Nichols, fluorescence, 779
Howes, H. L., & D. T. Wilber, fluorescence, 67
Hoxie, C. A., thermoelectric cell, 407
Hu, K. F., X-rays, 1164
Hu, K. F., & W. Duane, X-rays, 1163 ; X-ray series, 1165
Hubert, H., viewing maps, 216
Hürthle, K., differentiating machine, 325
Hughes, A. L., photoelectrics, 94
Hughes, A. L., & A. A. Dixon, discharge, 191
Hulett, 321
Hull, A. W., 566, 1259 ; crystal analysis, 380 ; dynatron, 300B
Humphreys, 1029
Hunt, F. L., 291
Hunter, A. F., solar haloes, 340
Hunter, A. F., & J. P. Henderson, solar halo, 625
Hunting, F. F., & W. J. Brooke, "Armco" iron, 425
Huntington, E., sun-spots and weather, 1220
Hurmuzescu, D., magnetostriction, 1179
Hurst, J. E., cast iron, 427 ; graphite in iron, 1204
Huse, K., photography, 367
Huse, K., & A. H. Nietz, sensitometry, 366
Huth, 1249
Huyghens, 900, 1152
Hyde, E. P., F. E. Cady, & W. E. Forsythe, colour temperature, 73
Hyde, E. P., & W. E. Forsythe, high-temperature scales, 541
Hyde, E. P., W. E. Forsythe, & F. E. Cady, radiation visibility, 929

Iitaka, I., cementite, 1281
Ikeuti, H., 1100
Ilyine, N. G., cementite, 126
Ingersoll, 56
Innes, R., 23 ; proper motions, 32 ; star parallax, 246 ; star positions, 31 ; Venus, 637
Innes, R. T. A., Hill's formulæ, 767
Ishida, Y., kinetic theory, 80
Ishino, M., 549
Ishiwara, J., gravitation, 909
Ishiwara, T., magnetisation, 414 ; steel carbides, 872
Ives, H. E., 359, 668, 1243 ; colour resolution, 669 ; photoelectric cell, 296
Ives, J. E., discharge, 1268

Jackson, B. H., & F. C. Clarke, Lecher system, 1270
Jackson, H., stretched wire phenomenon, 1276
Jacobi, 455, 639
Jaeger, 432, 557
Jäger, G., osmotic pressure, 808
Jaeger, R., dielectrics, 404
Jahn, 811
Jakob, M., Joule-Thomson effect, 966 ; thermodynamics, 85
Jaquerod, 964
Jaquerod, A., & H. Perret, radioactivity, 953
Jeans, J. H., 82, 387, 479, 542, 1224 ; star evolution, 252 ; stellar energy, 251 ; stellar universe, 36
Jeffreys, H., 919 ; atmospheric currents, 7 ; dwarf stars, 656 ; earth denudation, 1040 ; evaporation, 691 ; Mercury, 636 ; moon, 474 ; planet perturbations, 1044 ; solar system, 1224 ; tidal energy, 9 ; Wien's law, 694

Jeffries, Z., elasticity, 446; grain-size, 208, 584: tungsten, 1002
John, St., 910, 1160
John, A. St., structure of ice, 1027
John, C. E. St., line displacement, 247
John, C. E. St., & H. D. Babcock, iron arc, 64
John, W., dielectrics, 982
Johnsen, A., & O. Toeplitz, X-ray spectrogram, 382
Johnson, J. B., ionisation, 295
Johnston, A. B., & C. R. Hayward, copper in steel, 424
Joly, J., 273
Jonckheere, R., nebula, 149; Nova Aquilæ, 1066; Sirius, 1072
Jones, A. T., Melde's experiment, 857
Jones, A. T., & M. E[veline] Phelps, sound, 392
Jones, E. T., induction coil, 1269; magnetos, 728B
Jones, L. A., & R. B. Wilsey, photography, 365
de Jong, C., star motions, 1065
Joule, 544, 966
Joy, A. H., 1069, 1074, 1077
Joy, A. H., & W. S. Adams, Cepheid variables, 1073; Mira Ceti, 1068; star luminosities, 350
Joy, A. H., W. S. Adams, & G. F. Paddock, Nova Aquilæ, 1230
Juday, 238
Jung, F., gravitation, 608
Jungjohann, W., 793
Just, 875

Kadel, B. C., anemometer records, 336
Kahanowicz, M[arya], radiation law, 288
Kahn, K. D., & E. B. Spear, colloidal Au, 319
Kammer, G. D., & C. H. Viol, radium in warfare, 1099
Kapteyn, J. C., 20, 35, 1065, 1069; star motions, 1229
Karpowicz, A., 785
Karrer, E., neutral-tint screen, 772
Kasperowicz, W., interrupter, 869
Kaufmann, 551, 684, 820, 919
Kayser, H., elasticity, 885
Keene, 288
Keesom, W. H., 798, 1176
Keesom, W. H., & H. K. Onnes, specific heat, 960
Kelvin, 107, 201, 613
Kemble, E. C., specific heat, 539
Kempf, P., refraction on sun, 746
Kempf, R., hygrostat, 211
Kendall, J., & J. E. Booge, ionisation, 320
Kennard, E. H., 290, 373, 526; fluorescence, 377
Kennedy, G., A. T. Doodson, & J. Proudman, electromagnetics, 195
Kennelly, A. E., & P. L. Alger, flux distribution, 118B
Kerr, 56, 61, 775, 934, 990
Keyes, F. G., & R. B. Brownlee, vapour pressure, 282
Kia-Lok Yen, ion mobilities, 789, 790, 863
Kiess, C. C., α Canum Venaticorum, 482
Kiess, C. C., & W. F. Meggers, spectra, 1160
Kimball, H. H., nocturnal radiation, 1031
Kimball, H. H., & A. H. Thiessen, daylight intensities, 342
Kimura, 1038
Kimura, H., polar motion, 484
Kimura, M., & R. W. Wood, iodine spectra, 65; resonance spectra, 376; Zeeman-effect, 66
King, A. S., 1159; spectra, 1158
King, L. V., earth's interior, 345
King, L. V., & A. N. Shaw, sound transmission, 862
King, R. W., conductivity, 101
Kingsbury, E. F., 772
Kiplinger, C. C., ebullioscopics, 956
Kirchhoff, 82, 260, 404, 616
Kirkwood, 475
Kirschbaum, 1253
Klingelfuss, F., Coolidge tube, 1125
Klotz, O., light-pressure, 1247; submarine faults, 630
Knowlton, 222
Knox, R., single-impulse photography, 997
Knudsén, 444, 557
Knudsen, M., 688
Koch, 145, 840, 942, 1078
Koch, K. R., elasticity, 445
Koenig, 803
Koenigsberger, 45
Köppen, 237, 620
Koerner, W. E., electrolysis, 718
Kofler, M., & V. F. Hess, penetrating radiation, 274
Kohlrausch, 102, 433, 434, 883
Kohlrausch, K. W. F., γ-rays, 780, 1259
Kohn, H., c.p. of black body, 358
Kohnstamm, 389
Kokubu, N., & T. Takamine, Stark-effect, 942, 1093, 1094
Konen, H., 793
Koopmans, A. N., & G. Holst, discharge, 794
Korn, A., electromagnetics, 88, 186, 396, 911, 912, 1026
Kossel, W., 295, 528
Kottler, F., gravitational theory, 1213
Kraus, C. A., 433, 434
Krell, 217

Kremann, R., & H. Breymesser, electrolysis, 592
Kretschmann, E., 897; relativity, 457
Kron, 760, 836
Kroo, J., atom rings, 1110
Krüger, 1234
Kuenen, 1175
Küstner, 1065
Kunz, J., 98, 200, 1192
Kurlbaum, 288
Kurosawa, R., & M. Chikashige, system: Zn-Se, 576

van Laar, J. J., critical constants, 75; molecular attraction, 810
Lacchini, G. B., V Bootis, 248; Mira Ceti, 249
Lacroix, A., eruption, 240
Ladenburg, 12
Lagrange, 293, 616, 639
Lagrange, Garrigou-, P., atmospheric movements, 1222
Lahousse, J., entropy, 289
Lamb, 213
Lamla, E., 139
Lamont, 200
Lampa, A., vibrating strings, 782
Lampland, C. O., faint star, 768
Landé, A., optical activity, 1089
Landolt, 590
Lang, M., X-rays, 266
Langevin, 61, 200, 798, 934, 1187
Langley, 1150, 1243
Langmuir, 444
Langmuir, I., 276, 557; adsorption, 1279
Laplace-Poisson, 136
Larmor, J., 387, 471, 823, 1178, 1216; nature of heat, 695; solar prominences, 473
La Rosa, M., & U. De Luca, Hall-effect, 1278
Lasaulx, 771
Laski, G., ultramicroscopic particles, 141, 1209
Laskovski, Nova Aquilæ, 1066
Latour, M., & E. Haudié, reactive volt-amps., 1178
v. Laue, 142, 380, 566, 949, 950, 1155
v. Laue, M., 595; gravitation, 231; reflected X-rays, 1257
Law, E. F., heat treatment, 1129
Leathem, J. G., 821; fluid motion, 334, 456
Leavitt [Miss], 1239
Le Bas, G., volume curves, 421
Le Bel, J. A., cosmic system, 1079
Lebedev, 1247
Lecher, 1270
Leclanché, 717
Leduc, A., density of argon, 1172
Lee, 213
Leeds, M. E., steel treatment, 314
Lehmann, O., 12; liquid crystals, 1200
Leible, A. B., & F. C. Mathers, plating baths, 719
Leith, 1213
Leithäuser, 379
Leme, A.B.P., quantitative analysis, 714
Lemoine, 879
Lemoine, J., 315
Lempfert, 619
Lenard, 379, 875, 969
Lense, J., stellar theory, 1067
Lense, J., & H. Thirring, moon's motion, 825
Leonard, A. G. G., & P. Whelan, spectra, 524
Leslie, R. M., hardness, 1015
Leuschner, 490, 500
Levi-Civitá, 606, 908
Levin, 689
Levy, H., & W. L. Cowley, loaded struts, 890
Lewis, 811, 812, 962, 1006
Lewis, G. N., T. B. Brighton, & R. L. Sebastian, hydrogen electrode, 321
Lewis, G. N., E. D. Eastman, & W. H. Rodebush, specific heat, 540
Lewis, G. N., & G. E. Gibson, entropy, 177
Lewis, G. N., & H. Storch, bromine electrode, 438
Lewkonja, 1191
Liapin, N., gravitation, 17
Lichte, H., sound, 391
Lichtenecker, K., resistivity, 1272
Liebert, G., helium series, 1254; Stark-effect, 1253
Liebert, G., O. Hardtke, & J. Stark, Stark-effect, 1251
Liebisch, T., optical activity, 1249
Liebisch, T., & A. Wenzel, interference, 368
Liebmann, 136
Liénard, 1111, 1216
Lilienfeld, J. E., discharge, 401; X-rays, 944
Lilienfeld, J. E., & H. Seemann, X-rays, 945
Lilley, 818
Lind, S. C., J. E. Underwood, & C. F. Whittemore, $RaSO_4$ solubility, 534
Lindblad, B., & K. Lundmark, nebulæ, 148
Lindemann, 226, 227, 730, 815, 1105
Lindemann, F. A., Cepheid variables, 1060; stellar radiation, 479
Lindh, A. E., & G. Borelius, Hall-effect, 107
Linhart, G. A., electrolyte activities, 439
Lippich, 261
Livens, G. H., electrodynamics, 184
Lodge, O. J., 919; matter theory, 135, 470; Mercury, 636; osmotic pressure, 318

Loeb, L. B., 789, 863; gaseous ions, 551
Lohse, 1072
Long, M. B., W. B. Emerson, & W. W. Coblentz, lighttransmission, 1149
Loomis, 201
Lorentz, 84, 140, 229, 357, 457, 520, 820, 823, 907, 919, 982, 1112
Lorentz, H. A., 82, 88, 89, 357, 1103, 1108, 1111, 1216, 1217; gravitation, 729
Lorenz, 357, 557, 982
Loring, F. H., magnetic susceptibility, 988
Loschmidt, 230, 970
Lo Surdo, 942, 1093, 1157
Lo Surdo, A., 839, 866
Love, 253
Loveland, G. A., hailstorm, 463
Luca, U. De, & M. La Rosa, Hall-effect, 1278
Luckey, G. P., & C. W. Hill, lead in copper, 1126
Luckiesh, M., light absorption, 921
Luckiesh, M., & L. L. Mellor, light transmission, 922
Lübcke, E., wave-shape recording, 1168
Lüdemann, K., instrumental errors, 3
Lumière, L., vision, 928
Lummer, 175, 386
Lundmark, K., & B. Lindblad, nebulæ, 148
Lyneland, 676
Lunt, J., 42 Capricorni, 756
Lury, R. E. De, spectro-comparator, 44
Lux, H., photography, 931
Lyle, 1120
Lyle, F. W., boron conductors, 797
Lyman, 1250

van Maanen, A., 640; nebula, 255
van Maanen, A., F. Ellerman, & F. H. Seares, sun's axis, 472
van Maanen, A., F. Ellerman, F. H. Seares, & G. E. Hale, sun's magnetism, 1078
McAdie, A., evaporimeter, 442
McBain, J. W., chemical reaction, 431
McCance, A., 119; inclusions in steel, 1132
McClelland, J. A., 1184
McClelland, J. A., & P. J. Nolan, ballo-electrics, 1264
McClelland, J. A., & C. J. Power, tribo-electricity, 700
McDavid, J. W., gas ignition, 76
Macdonald, 184
McDowell, [Miss] L. S., & [Miss] F. G. Wick, luminescence, 1095
McGougan, A. G., α-rays, 1102
Mach, 194, 897
Mache, H., & L. Flamm, combustion, 690
MacInnes, D. A., & J. M. Braham, calorimeter, 174
McKay, C. A., & A. E. Caswell, Peltier-effect, 1274
McKeehan, L. W., actinium emanation, 172
McLaren, 200
McLennan, 95, 161, 941
MacMillan, W. D., stellar evolution, 1237
McNutt, B., & W. S. Franklin, electric waves, 697
Madelung, 200, 972
Maggini, 1066; moon, 638
Maggini, M., photometer, 662
Magnus, 850
Maire, R., & G. Rümelin, steel transformations, 1191
Majorana, Q., speed of light, 50, 927, 1087
Mallard, 176, 690, 1262
Mallock, A., interference, 1153; long-range guns, 448
Malmer, 268
Malmström, R., β-rays, 684; electrodynamics, 89; Riemann's hypothesis, 820
Mancini, C. F., water-hammer, 601
Manetti, G., shell trajectories, 1022
Marage, explosive sounds, 394
Mariotte, 966, 1172
Marrian, 1276
Martel, 817
Martin, C., 644
Martin, C., & H. C. Plummer, RS Boötis, 1062; RZ Cephei, 483; variable star, 33; W Ursæ Minoris, 1063
Martin, H. H., haloes, 1034, 1035
Martin, P., Kerr-effect, 990
Marvin, 1011
Marvin, C. F., unit of pressure, 1144
Mascart, 357
Mashimo, T., electrolytic cell, 1008; spectrum, 938
Masloff, A. M., Ni-Cr steels, 583
Mason, W., & R. V. Wheeler, flame propagation, 176; inflammability, 283
Mathers, F. C., & A. B. Leible, plating baths, 719
Mathers, F. C., & K. S. Means, plating baths, 720
Mathers, F. C., K. S. Means, & B. F. Richard, electrolysis, 721
Mathew, 222
Mathews, J. H., vaporisation heat, 77
Mathiesen, W., arcs, 217B
Matsushita, T., contraction of steels, 1004
Matsuyama, M., Jaluit Atoll, 917
Matthiessen, 299, 1272
Matweieff, M., martensite, 582
Mauchly, 1116
Mauchly, S. J., earth-currents, 992

Maunder, E. W., 201, 993
Maurer, J., meteorology, 737; solar coronæ, 626
Mawson, D., aurora, 661
Maxted, E. B., ammonia synthesis, 715
Maxwell, 88, 99, 184, 261, 293, 386, 387, 610, 881, 907, 1908, 910, 934, 972, 1026, 1067, 1213, 1216
Mayer, 1161
Mazérès, projectile localisation, 203
Mazo, G., & Tauleigne, radiography, 800
Means, K. S., F. C. Mathers, & B. F. Richard, electrolysis, 721
Means, K. S., & F. C. Mathers, plating baths, 720
Mees, C. E. K., scientific knowledge, 233
Meggers, W. F., 1160; solar spectrum, 631; spectrometry, 777
Meggers, W. F., & C. C. Kiess, spectra, 1160
Meissner, K. W., Ne spectrum, 265
Meissner, O., meteorology, 1223; seismology, 469
Meitner, L., thorium, 952
Meitner, L., & O. Hahn, prot-actinium, 951
Melde, 392, 857
Mellor, L. L., & M. Luckiesh, light transmission, 922
Melotte, 353, 761, 1237
Mendenhall, C. E., 386; radiation, 86
Mercanton, P. L., glacier bubbles, 145; magnetised basalt, 198
Merica, P. D., & L. W. Schad, α-brass, 774B
Merritt, E., 67, 373, 527, 566
Merton, T. R., Stark-effect, 1157
Merwin, H. E., pigment colours, 834
Mesnager, beams, 220; charged plate, 91
Meuthen, A., 689
Meyer, 162
Meyer, C. F., fluorescence, 162
Meyer, E., & H. Schüler, kathode rays, 1265
Meyer, H., & P. Oberhoffer, streaky iron, 124
Meyer, S., 173; periodic system, 1134
Meyer, S., & E. v. Schweidler, radio-elements, 383
Meyerheim, 936
Michelson, 89, 261
Michelson, A. A., 146; optical surfaces, 1082
Michelson, Morley-, 88, 480, 919
Mie, G., 142, 907; gravitation, 232
Miller, S. W., etching agent, 589
Millikan, R. A., 72, 161, 785, 971, 1263
Mills, J. E., molecular attraction, 311
Minkowski, 1213, 1217
Minkowski, Einstein-, 88
v. Mises, R., kinetic theory, 610
Mitchell, W. M., 349, 1078
Mitra, S. K., diffraction, 362
Möbius, 477
Moffitt, G. W., lens, 516
Mohammad, Wali-, C., 676
Mohler, F. L., 1266
Mohler, F. L., C. O. Fairchild, & P. D. Foote, absorption glass, 60
Mohler, F. L., & P. D. Foote, discharge, 1266
Mohler, F. L., & R. W. Wood, resonance radiation, 374
de Moidrey, J., 115; magnetic pulsations, 116
Moissan, H., 299
Moll, 364
Moll, W. J. H., & L. S. Ornstein, liquid crystals, 312
Mondain, localising compass, 419
Moore, C. N., & W. D. Coolidge, X-ray outfit, 572
Moore, R. B., radium, 1168
Moore, W. C., "Vosmaer" effect, 702
More, L. T., 1116
More, L. T., & L. M. Alexander, kathode rays, 1116
Morgan, J. L. R., M. A. Griggs, & A. J. Scarlett, Jr., mixed liquids, 436
Morgans, T. D., & F. Rogers, acid steel, 426
Moritz, R., cusped orbit, 256
Morley, A., columns, 599
Morley-Michelson, 88, 480, 919
Morris, H. H., chemistry of Au, 998
Mortara, N[ella], X-ray tubes, 196
Morton, 373
Moseley, 160, 167, 226, 227, 228, 267, 272, 458, 530, 1110, 1165, 1250
Moss, S. A., gravity, 1143
Mott, W. R., flame arc, 791
Moulin, 288
Mühlestein, E., α-rays, 1100
Müllendorff, 200
Mueller, 174
Müller, 983
Muller, A., X-ray spectrum, 1096
Mundt, C. S., Erida's orbit, 491
Muntz, 804
Murakami, T., 872
Murakami, T., & K. Honda, tungsten steels, 876
Murray, Erskine-, J., 326
Mylius, F., pure metals, 423

Nägel, 690
Nagaoka, H., force between currents, 705; grating, 263; radiation theory, 82
Nakamura, S., dilatation, 955; earthquakes, 346
Nakayama, W., bent antenna, 1114
Nansen, 213

Natanson, 520
Nathanson, J. B., optics of Rb, 514
Neill, W. T., refraction, 245
Nemirovsky, 419
Neovius, 680
Nernst, 78, 79, 81, 226, 309, 389, 730, 815, 962, 1105
Nernst, W., 113, 177, 961
Neubauer, F. J., 1226; asteroid's orbit, 490
Neubert, P., discharge, 400
Neumann, 293
Newcomb, 1065
Newkirk, B. L., nebula, 26
Newman, 552
Newton, 134, 281, 450, 453, 470, 605, 1216, 1217
Newton, H. A., 499
Newton-Gladstone, 357
Nichols, 526
Nichols, E. L., 373, 527
Nichols, E. L., & H. L. Howes, fluorescence, 779
Nichols, H. W., electrodynamics, 90
Nicholson, J. W., 271, 615; atomic stability, 611; electron, 292; nebulæ, 762; spectral series, 523*
Nietz, A. H., & K. Huse, sensitometry, 366
Niggli, P., crystal structure, 949
Nijland, Mira Ceti, 40
Nitta, S., Stark-effect, 841
Nölke, F., sound, 183
Noell, 966
Noell, F., Joule-Thomson effect, 544
Nogier, T., radiology, 994
Nolan, J. J., water-jet ions, 294
Nolan, P. J., & J. A. McClelland, ballo-electrics, 1264
Nordmann, 1079
Nordström, G., gravitation field, 1019; gravitation theory, 822
Nort, H., star-counts, 1232
Northrup, E. F., 559
Northrup, E. F., & F. R. Pratt, Wiedemann-Franz ratio, 103
Nosé, J., & M. Chikashige, system: Te-Al, 577
Noyes, A. A., 433
Noyes, A. A., & M. Chow, chloride electrodes, 1136
Noyes, A. A., & J. H. Ellis, free energy of HCl, 811
Nutting, P. G., 49, 178, 667, 668
Nyquist, 1251

Obata, J., Ag voltameter, 563; Weston cell, 981, 1118
Obber, 1053
Oberhoffer, P., & P. Hartmann, streaky iron, 123
Oberhoffer, P., & H. Meyer, streaky iron, 124
Okada, T., seasonal correlations, 339, 462
Okano, S., 63
Oknoff, M., quenching metals, 125
Ōkubo, J., 1123
Ōkubo, J., & K. Honda, ferromagnetics, 411; hysteresis, 410
Oldham, R. D., 346, earthquakes, 629
Olivier, C. P., meteors, 29
Omori, chimney vibrations, 1039
Onnes, H. K., 613, 798
Onnes, H. K., J. M. Burgers, & P. G. Cath, thermometry, 961
Onnes, H. K., & P. G. Cath, vapour pressures, 957, 959
Onnes, H. K., C. A. Crommelin, & P. G. Cath, critical points, 285
Onnes, H.K., & W. H. Keesom, specific heat, 960
Oosterhuis, 101, 798, 1192
Orgler, 794
Ornstein, L. S., 389
Ornstein, L. S., & W. J. H. Moll, liquid crystals, 312
Ornstein, L. S., & F. Zernike, density, 595
Osborne, N. S., calorimeter, 535
Osborne, N. S., & M. S. Van Dusen, latent heat, 278; specific heat, 277
Osborne, W. A., gel structure, 1203
Oseen, C. W., 934
Osthoff, H., star brightness, 24
Ottenstein, R., sound screen, 180
Owen, E. A., 1256; h.f. spectrum of Pd, 682; X-rays, 943, 1162
Oxley, A. E., diamagnetism, 1277

Paddock, G. F., 1230; Nova Monocerotis, 1071
Paddock, G. F., W. S. Adams, & A. H. Joy, Nova Aquilæ, 1230
Page, L., progress in physics, 903; moving star, 471; retardation of moving mass, 823
Pailhade, de R., stellar distance, 510
Painlevé, 617
Palatini, A., relativity, 144
Palazzo, L., eclipse magnetograms, 873
Palisa, 490
Paneth, F., 173
Parankiewicz, I[rene], 970, 1263; charged spherules, 188; electronics, 395; Stokes' law, 1211
Park, J., 210
Parkhurst, J. A., Pleiades, 643
Parson, A. L., 108, 397, 566
Parsons, [Miss] H. McW., 643; Pleiades, 642
Paschen, 386, 1160
Pasukhin, V., cyanide process, 210
Paterson, C. C., 259
Pauer, F., light polarisation, 1090
Paulson, J. E., Ni spectrum, 372

Payman, W., & R. V. Wheeler, flame propagation, 1171
Pease, F. G., 25, 492, 652, 653, 655; nebula, 506; nova, 647; Nova Persei, 485
Peck, E. L., nitrogen in snow, 239
Péclet, 217
Peczalski, T., resistivity, 867
Pegram, G. B., unipolar induction, 290
Pélabon, 809
Peltier, 106, 107, 403, 430, 558, 1188, 1274
Perot, Fabry-, 261
Perreau, 357
Perret, H., & A. Jaquerod, radioactivity, 953
Perrier, B., calorimetry, 1170
Perrin, 880
Perrine, C. D., 751, 1076; γ Argus, 641; double stars, 757; nebulæ, 151; radial velocity, 30; star spectra, 758, 1077; stellar motions, 41, 1075
Perrot, F. L., 107
Perrotin, H., meteorology, 827; nocturnal cooling, 740
Perutz, 931
Peters, 432
Peters, W. J., dip of horizon, 914
Petit, 892
Pettersson, H., densimeter, 327
Pettersson, H., & A. Ångström, hydrometer, 1
Petzval, 753
Peyriguey, J., waterspouts, 744
Pflüger, 879
Pfund, 940
Phelps, M. E[veline] & A. T. Jones, sound, 392
Phillips, P., 551
Phillips, T. E. R., 507; Jupiter, 1048; Nova Aquilæ, 1066; variable stars, 644
Piccard, A., 1192; magnetisation, 303
Piccard, A., & P. Weiss, thermomagnetics, 991
Pickering, 644, 1250
Pickering, E. C., variable stars, 503
Pickering, W. H., 638; nebula distance, 1233; pleiades, 769; star colours, 38
Pictet, 964
Pieck, V., quenched spark, 554
Pier, 690
Pierce, S. E., 1162
Pierson, H. L., H. S. Bennett, & T. R. Briggs, endosmose, 880
Pilon, 977
Piola, F., hysteresis, 199
Planck, 72, 78, 86, 185, 284, 292, 387, 389, 398, 529, 539
Planck, M., 79, 81, 82, 177, 542, 935, 968
Plank, R., 85
Plaskett, J. S., Nova Aquilæ, 1231
Plato, F., normal temperature, 958
Plenz, F., 283
Plotnikov, 434
Plummer, H. C., 644; coupled circuits, 138
Plummer, H. C., & C. Martin, R. S. Boötis, 1062; RZ Cephei, 483; variable star, 33; W Ursæ Minoris, 1063
Pluvinel, A. de la B., astronomy, 11
Pocock, R. J., star numbers, 763
Pogány, B., Faraday-effect, 56
Poincaré, 256, 387, 830, 1067, 1225
Poisson, 816, 887, 909, 1213
Poisson, Cauchy-, 468
Poisson, Laplace-, 136
Pollitzer, 815
Pollok, J. H., 524
Popov, 432
Popplewell, W. C., & H. Carrington, strut failure, 818
Porter, A. W., osmotic pressure, 318; sulphuric acid, 1131
Porter, R. W., testing mirrors, 1081
Portevin, A., 877
Portevin, A., & V. Bernard, steel macrostructure, 878
Portevin, P., & Garvin, quenched metals, 119
Posejpal, V., refraction, 357
Poucholle, A., vibratory motions, 443
Power, C. J., & J. A. McClelland, tribo-electricity, 700
Poynting, 1216
Poynting, J. H., 184, 1146
Pratt, F. R., dilution heats, 1135
Pratt, F. R., & E. F. Northrup, Wiedemann-Franz ratio, 103
Press, A., helix capacity, 795
Priest, I. G., artificial daylight, 1246; visibility function, 1245
Pringsheim, 175, 386
Proudman, J., A. T. Doodson, & G. Kennedy, electromagnetics, 195
Puccianti, 288
Pupin, 90
Purkinje, 24, 837
Pyle, L., howler as generator, 886B

Quittner, 410

Ramage, A. G., mirage, 1242
Raman, C. V., 362, 392; wolf-note, 859, 860
Ramsay, 309, 1172
Rankine, 731, 828
Rasch, 358
Ratner, S., Ra deposit, 171
Ratnowsky, 387, 962
Raveau, C., thermodynamics, 1178
Rawdon, H. S., metal corrosion, 804
Ray, A. B., & L. M. Dennis, electrolysis, 322

Rayet, Wolf-, 655, 1077
Rayleigh, 82, 223, 261, 386, 519, 542, 781, 982, 1025, 1154, 1212, 1269; bubble pressure, 5; collodion films, 154; light-scattering, 517, 664; lubrication, 329; oily films, 330; optical retardations, 673; reflection, 48; sound propagation, 861
Rayleigh-Zeiss, 54
Raymond, W. J., harmonic synthesiser, 1010
Reboul, G., wind variation, 621; hoar frost, 1219
Reboul, G., & L. Dunoyer, wind variation, 234
Recknagel, G., 217
van Reesema, N. H. S., light absorption, 364
Reeves, P., 1243; radiation visibility, 668; retinal threshold, 1244; visible radiation, 48; vision, 157
Reggianni, 213
Regnault, 282, 853, 964, 1174, 1175
Reiche, F., paramagnetism, 798
Reina, V., atmospheric refraction, 738
Reinders, W., & L. Hamburger, metal films, 895
Reinhold, M., earth's field, 707
Reissner, H., 453
Renwick, F. F., photography, 932
Renwick, F. F., W. B. Ferguson, & D. E. Benson, photometer, 920
Renwick, F. F., B. V. Stoor, & H. J. Channon, scattering media, 665
Revillon, 583
Rey, J., petrol entropy diagram, 543
Reynolds, O., 223
van Rhijn, P. J., 353, 1069; star numbers, 493
Rice, M., 1259
Richard, B. F., K. S. Means, & F. C. Mathers, electrolysis, 721
Richards, 213, 563, 1118
Richards, J. W., steel resistivity, 1119*
Richards, T. W., 77
Richards, T. W., & V. Yngve, thermometry, 279, 313
Richardson, 412
Richardson, O. W., X-rays, 529
Richardt, 176
Richarz, 875
Richter, O., 689
"Riefler," 1208
Riemann, 89, 820, 908
Riemen, 1116
Riggenbach, A., gravity, 130
Righi, 1116
Ritchey, G. W., 25, 39, 649, 650, 653; nova, 495; novæ in nebulæ, 648; Nova Persei, 492
Ritz, 612, 1192
Ritz, W., 50, 89, 523, 820, 1250
Rivière, 357
Robertson, 283
Robin, F., 587, 1129
Robinson, C. S., & S. L. Bigelow, osmotic pressure, 807
Robson, 1175
Rodebush, W. H., E. D. Eastman, & G. N. Lewis, specific heat, 540
Rogers, F., & T. D. Morgans, acid steel, 426
Rognley, O., 549
Rognley, O., & A. H. Compton, magnetic theory, 566
Rogowski, 200
Rolf, 1032
Ronca, 1022
Ropiquet, C., 417; radioscopic localiser, 799
Rosa, E. B., 259
Rosa, M. La, & U. De Luca, Hall-effect, 1278
Rosenhain, W., 118
Ross, F. E., stellar images, 52
Rothe, H., gas theory, 84
Rowland, 937
Roy, A. J., meridian circle, 43
de Roy, F., Nova Aquilæ, 1066
Roy, L., reflection, 776
Rubens, 515, 615, 972
Rubinowicz, A., diffraction, 260
Rückert, E., electric waves, 978
Rümelin, G., & R. Maire, steel transformations, 1191
Rütten, 677
Rumpf, E., discharge, 297
Runge, 1160
Runge, C., X-ray analysis, 70
Russ, S., radio-therapy, 573*
Russell, 1243
Russell, A., electrostatics, 699
Russell, A. S., 68, 549
Russell, H. N., 49, 253, 351, 359, 769, 1239; masses of the stars, 481
Rutherford, 69, 167, 530, 611, 789, 944, 1259
Rydberg, 228, 291, 523, 1215, 1250
Ryder, H. M., J. C. Churchill, & W. R. Ham, vapour pressures, 963

Saha, M. N., electron, 1217; interferometry, 261
St. John, A., structure of ice, 1027
St. John, C. E., 910, 1160; line displacement, 247
St. John, C. E., & H. D. Babcock, iron arc, 64
St. Venant, 223
Salcher, 194
Sale, J. W., & W. W. Skinner, oxygen in salt water, 238
Salinger, H., discharge, 556
Sampson, 761

Sampson, R. A., 816; time-keeping, 1208; time measurement, 1013
Samson, C., Braun tube, 983
Sanford, F., dielectrics, 1181; raindrops, 1183; spectral series, 1250
Satterley, J., & R. T. Elworthy, radioactivity, 1169
Saunders, 386
de Saussure, R., meteorology, 826
Scarlett, A. J., Jr., J. L. R. Morgan, & M[ary] A. Griggs, mixed liquids, 436
Schachenmeier, R., crystal lattice, 142, 533; diffraction, 59
Schad, L. W., & P. D. Merica, α-brass, 774B
Schäfer, 883
Schaefer, C., Lagrangeian equations, 616
Schaefer, C., & [Miss] M. Schubert, reflection, 940*
Schames, L., 85
Scheel, 544
Scheffer, 51
Scheiner, 288
Schenk, 312
Schering, H., & R. Schmidt, vibration galvanometer, 560
Scherrer, P., 70, 169, 381, 382, 1090; crystal structure, 381
Schidlof, A., electronic charge, 785; light speed, 1084
Schimank, 969
Schjelderup, H., 1257
Schjelderup, H., & L. Vegard, crystal structure, 681
Schleiermacher, 687
Schlesinger, F., error determination, 147; transit instrument, 770
Schlick, O., 1024
Schlink, F. J., weighing scale, 724
Schlundt, R. H., & [Mrs.] A. Cable, Ra extraction, 1104
Schlussel, L., impulse measurement, 594
Schmidt, 660
Schmidt, A., oscillations in variable field, 451; terrestrial magnetism, 1194
Schmidt, G. C., conductivity, 1184
Schmidt, R., & H. Schering, vibration galvanometer, 560
Schmidt, W., 61; seismogrammetry, 627
Schmidt, W., & V. F. Hess, radioactivity, 683
Schönfeld, 660, 1070
Schoenflies, 949
Schönrock, 261
Schott, G. A., atomistics, 1216; electron, 1111
Schottky, 689
Schrödinger, E., 728, 824; acoustics, 181; gravitational equations, 452; gravitational field, 331
Schubert, [Miss] M., & C. Schaefer, reflection, 940
Schüler, H., & C. Meyer, kathode rays, 1265
Schultz, H. I., & E. D. Tillyer, lenses, 774
Schultze, 1274
Schultze, H., 966
Schulz, H., polarising prisms, 923
Schumann, 162
Schunck, C. A., radio-therapy, 573
Schuster, 632
Schuster, A., 568, 665, 866, 1265; radiation, 542
Schwarzschild, 284, 286, 331, 605, 778, 968, 1062
v. Schweidler, E., & S. Meyer, radio-elements, 383
Schweydar, W., earth's deformation, 829
Schwoerer, E., solar constant, 735
Scoble, W. A., pin joints, 733
Scott, W., & F. A. Gooch, electro-analysis, 1206
Seares, F. H., 1062; star concentration, 35; star condensation, 20; stellar universe, 21
Seares, F. H., A. van Maanen, & F. Ellerman, sun's axis, 472
Seares, F. H., A. van Maanen, F. Ellerman, & G. E. Hale, sun's magnetism, 1078
Searle, [Miss] N. S., & A. M. Tyndall, discharge, 402
Sebastian, R. L., 811
Sebastian, R. L., T. B. Brighton, & G. N. Lewis, hydrogen electrode, 321
See, 830, 1072
Seeman, H., reflected X-rays, 531
Seemann, H., & J. E. Lilienfeld, X-rays, 945
Selényi, P., light reflection, 663, 1241
Selga, 1227
Senftleben, H., & [Miss] E. Benedict, optics of carbon, 513
Shaha, M. N., & S. N. Basu, state equation, 1173
Shapley, H., 148, 351, 495, 644, 652; nova, 653; novæ in nebulæ, 649; star clusters, 650, 651, 1238, 1239
Shapley, H., & W. S. Adams, S.U. Cassiopeiæ, 640
Shapley, H., & J. van Der Bilt, W Ursæ Majoris, 351
Shaw, A. N., humidity, 741; thermostat, 954
Shaw, A. N., & L. V. King, sound transmission, 862
Shaw, N., 461, 619; meteorology, 8
Shaw, P. E., tribo-electricity, 92
Shelton, H. S., atomic weights, 117
Shepherd, 118, 716
Sherwood, R. G., & J. E. Shrader, high vacua, 444, 1023

Shields, M[argaret] C., specific heat, 175
Shimizu, T., & W. Duane, X-rays, 1166
Shinjo, 1037
Shook, G. A., spectrophotometer, 355
Shore, 424
Shrader, J. E., & R. G. Sherwood, high vacua, 444, 1023
Siacci, 1022
Siegbahn, M., 268, 528
Siegbahn, M., & W. Stenström, X-ray spectra, 69
Silberstein, L., 160, 1044; lens, 361; planetary motion, 749; relativity, 910
Silsbee, F. B., super-conductivity, 1187
Simidu, T., conductivity, 102
Simidu, T., & K. Honda, conductivity, 405
Simpson, 875
Simpson, H. E., tornado, 341
de Sitter, W., 607, 749; gravitation, 134; curvature of space, 16; Jupiter's satellites, 1049
Sizes, G., sound, 393
Sjöström, M., electric waves, 99
Skeats, E. W., coral-reefs, 241
Skinner, C. A., 193; discharge, 1185, 1186
Skinner, W. W., & J. W. Sale, oxygen in salt water, 238
Sleator, W. W., light absorption, 1150
Slipher, V. M., 680; comet, 244; nebulæ, 486; spiral nebula, 659; star clusters, 254
Smart, W. M., planet's libration, 639
Smeeth, W. F., & H. E. Watson, radio-activity, 275
Smekal, A., thermodynamics, 388, 854
Smith, 77, 563
Smith, A. W., Hall-effect, 113
Smith, A. W., & A. W. Smith, magnetic susceptibility, 1193
Smith, D. P., & N. T. Gordon, Cu-Ni alloys, 716
Smith, J. W., meteorology, 1033
Smith, S. W. J., & W. de W. Abney, colour vision, 156
Smith, T., optics, 926; telescope objectives, 671; thin objectives, 258
Smith, T., & [Miss] A. B. Dale, cemented objectives, 257
Smither, F. W., & P. H. Walker, glassware tests, 1201
Smits, A., & C. A. L. de Bruyn, Ni potential, 440
v. Smoluchowski, M., 230
Snethlage, [Miss] A., 614
So, M., dilatation, 1260
Soddy, F., 117, 549
Soddy, F., & J. A. Cranston, actinium, 847
Solá, J. C., P Ophiuchi, 250; stellar currents, 750, 1064
Sommerfeld, 1110, 1248
Sommerfeld, A., 260, 284, 530, 612, 944, 968, 1090; atomic structure, 1258; dispersion, 520
Sosman, R. B., & J. C. Hostetter, mercury still, 420
Southwell, 818
Spear, E. B., & K. D. Kahn, colloidal Au, 319
Sperry, E. A., 1024
Spoerer, 746
Srnka, O., coordinate transformation, 715B
Stark, 532, 611, 839, 840, 841, 866, 942, 1093, 1094, 1157, 1253, 1254, 1265
Stark, J., 400, 1161; helium series, 1252; hydrogen spectrum, 522; northern lights, 745
Stark, J., M. Görcke, & M. Arndt, canal-rays, 532
Stark, J., O. Hardtke, & G. Liebert, Stark-effect, 1251
Stead, 878
Stead, J. E., iron carbonisation, 1128; steel inclusions, 999
Stebbins, J., 1080
Steele, 309
Stefan, 71, 83, 288
Stefan-Boltzmann, 73, 86, 1214
Stefanini, A., sound, 179
Stegeman, G., & W. E. Henderson, Pb standard cell, 323
Steinberg, J. C., & Le R. D. Weld, solution, 209
Steiner, 568
Steinhaus, 564
Steinmetz, 200, 410
Steinmetz, C. P., periodic system, 801; thermometry, 280
v. Steinwehr, 432
Stenström, W., & M. Siegbahn, X-ray spectra, 69
Stewart, 50
Stewart, J. Q., Richardson-effect, 412
Stirling, 610
Störmer, C., 661; aurora, 150, 505
Stokes, 373, 454, 526
Stokes-Cunningham, 141, 188, 1211
Stokes, G. G., 48, 294
Stoney, 802
Storch, H., & G. N. Lewis, bromine electrode, 438
Storr, B. V., F. F. Renwick, & H. J. Channon, scattering media, 665
Straneo, P., similitude principle, 1214
Street, R. O., tidal energy, 9
Strehl, 361
Strömberg, G., 646, 1075; solar motion, 646
Strömberg, G., & W. S. Adams, binary star, 1052; star magnitudes, 1076
Stromeyer, C. E., mild steel, 207*

Strutt, R. J., 1151 ; active nitrogen, 803 ; atmosphere's transparency, 466 ; discharge, 194 ; light-scattering, 835
Strutt, R. J., & A. Fowler, ozone spectrum, 12
Struve-Baumstark, 1203
Stuckardt, 879
Stütting, 372
Stumpf, C., vowel sounds, 783
Sullivan, A. P., & M. de K. Thompson, depolarisation, 437
Surdo, Lo, 942, 1093, 1157
Surdo, A. Lo, 839, 866
Sutherland, W., 551, 899
Sutton, T. C., mechanical heat-equivalent, 384
Suwalski, M., elasticity, 1017
Suydam, 103
Svärdson, J., comet, 14
Swann, 544
Swann, W. F. G., 101 ; electromagnetics, 548
Swientoslawski, W., thermochemistry, 432
Swinton, A. A. Campbell, 865
Swisher, C. L., thermo-electrics, 299
"Synchronome," 1208

Taffanel, 283
Takagi, H., 414
Takagi, H., & K. Honda, Ni steels, 871
Takamine, T., 676, 841, 1157
Takamine, T., & N. Kokubu, Stark-effect, 942, 1093, 1094
Takamine, T., & U. Yoshida, discharge, 866 ; Stark-effect, 839, 840
Takatsu, K., & M. Tanaka, pentane lamp, 259
Talbot, 62
Tamaki, K., electromagnetics, 1112
Tammann, 689
Tanaka, M., & K. Takatsu, pentane lamp, 259
Targonski, A., 785
Tate, J. T., 1186
Tate, J. T., & P. D. Foote, ionisation potentials, 63, 378, 941 ; anode films, 193
Tauleigne, & G. Mazo, radiography, 800
Taylor, G. I., 464, 827 ; atmospheric turbulence, 237
Taylor, G. I., & A. A. Griffith, torsion, 221
Taylor, T. S., density of He, 309
Tchopovsky, Fechtchenko-, S. A., Fe cementation, 120
Terada, T., electromagnetics, 158 ; lake temperature, 465
Terazawa, K., deep-sea oscillations, 468 ; gravity, 146
Terres, E., 283
Thackeray, W. G., & F. W. Dyson, star density, 22
Thenard, Cornu-, A., & G. Charpy, shock tests, 129
Thiessen, A. H., & H. H. Kimball, daylight intensities, 342
Thirkill, 1116
Thirring, H., electromagnetics, 907 ; gravitation, 449
Thirring, H., & J. Lense, moon's motion, 825
Thomas, N., & A. Ferguson, evaporation, 71
Thomas, P., comparing capacities, 1189
Thompson, M. de K., & A. P. Sullivan depolarisation, 437
Thompson, M. R., 437
Thompson, S. P., 199, 884
Thomson, 50, 106, 229, 544, 558, 966, 1188, 1275
Thomson, H., Nova Aquilæ, 1066
Thomson, J. J., 95, 101, 163, 187, 294, 523, 615, 1217, 1274 ; atomic structure, 904
Thuras, A. L., hydrometry, 213
Thuras, A. L., & E. E. Weibel, salinometer, 593
Tiede, 803
Tikhoff, 1079
Tillyer, E. D., & H. I. Shultz, lenses 774
Tinker, F., osmotic pressure, 318
Tisserand, 453
Tissot, 1079
Toepler, M., discharge, 555 ; viscosity, 1016
Toeplitz, O., & A. Johnsen, X-ray spectrogram, 382
Tolman, 1214
Tolman, R. C., quantum theory, 852
Tomkins, J. A., focometry, 360
Townsend, 95, 96, 794, 1186, 1268
Trabacchi, G. C., Braun tube, 986 ; spark coil, 977
Trabacchi, G. C., & O. M. Corbino, spark coil, 1124
Travers, 1172
Treadwell, W. D., gas equilibria, 81
Tresca, 345
Trousdale, E. A., 566
Trowbridge, C. C., auroral streamers, 1080
Trümpler, 643
Tschudy, W., vacuum gauge, 883
Tucker, R. H., atmospheric refraction, 766 ; star-counts, 1070 ; star magnitudes, 765
Tumlirz, O., liquid flow, 602
Turner, H. H., 20, 35, 763 ; long-period variables, 507 ; photographic magnitudes, 645 ; stellar scales, 352 ; stellar universe, 21

Turner, W. E. S., & S. English, glass annealing, 422
Turnock, L. C., Edison cell, 839B
Turrell, 573
Twyman, F., 1082; interferometer, 356
Tyndall, A. M., & [Miss] N. S. Searle, discharge, 402

Ueta, Y., Nova Aquilæ, 1066
Uhler, H. S., 525, 1098; constant-deviation prisms, 675; X-ray analysis, 844; X-ray spectrum, 1098
Uhler, H. S., & C. D. Cooksey, h.f. spectrum of Ga, 267
Uibe, M., & H. Dember, sky's form, 1147
Uller, K., physical wave, 225; surface waves, 1212
Ulrey, C. T., X-ray spectra, 842
Ulrey, D. L., electrode p.d.'s, 1137
Underwood, J. E., S. C. Lind, & C. F. Whittemore, Ra SO_4 solubility, 534
Unwin, W. C., hardness, 817

Valentiner, 288, 1105
Vallauri, G., ferro-magnetics, 200
Van Der Bilt, J., 33
Van Der Bilt, J., & H. Shapley, W Ursæ Majoris, 351
Van Dusen, M. S., & N. S. Osborne, latent heat, 278; specific heat, 277
Van Zandt, J. P., oscillating systems, 137
Veazey, J. A., 379
Vegard, L., 838, 1110, 1257; X-ray spectra, 530
Vegard, L., & H. Schjelderup, crystal structure, 681
Velander, E., magnetised iron, 989
Venant, St., 223
Verdet, 1090
Véronnet, A., moon, 243; nebulæ, 634, 1058; star temperature, 1059; sun's constitution, 488; sun's contraction, 1045; sun's temperature, 633
Verschaffelt, J. E., state equation, 389; viscosity, 965
Verzat, earth temperatures, 1042
Vesper, J. L., & H. H. Martin, haloes, 1035
Vessiot, E., wave propagation, 900
Villard, 1265
Viol, C. H., & G. D. Kammer, radium in warfare, 1099
de Visser, J. S., & G. Holst, black body, 837
van Vleuten, [Miss] A., 1194; earth's field, 568, 569
Vogel, E., 544
Vogel, O., & O. Bauer, Al-Zn alloys, 118
Voigt, W., 56, 107
Volta, 403
Volterra, 200
Vorländer, 1249
Vosmaer, 702
Voss, V., spectra, 371
Voûte, J., 1236; α Centauri, 23; star spectra, 755

van der Waals, 109, 389, 390, 613, 899, 966, 1173
van der Waals, J. D., Jr., 614
Waetzmann, E., sound beats, 858
Waggoner, C. W., photography, 512
Waggoner, C. W., & H. M. Freeman, magnetisation, 409
Wagner, 558, 844, 980
Wagner, E., 100; X-ray spectroscopy, 167
Waidner, 386
Wali-Mohammad, C., 676
Walker, G. W., 636, 1111; matter theory, 919
Walker, P. H., & F. W. Smither glassware tests, 1201
Wallot, 1105
Walter, B., lightning flashes, 1115; radio-activity, 173
Wanach, 484
Wantzel, 223
Warburg, E., photochemistry, 879
Ward, R. De C., meteorology, 915; rainfall, 1030
Warner, E. H., 205; discharge, 98
Washburn, E. W., & H. J. Weiland, electrolyte conductance, 433
Watanabe, N., gyro-stabiliser, 1024
Watson, H. E., & W. F. Smeeth, radio-activity, 275
Watts, O. P., & A. Brann, plating solutions, 722
Watts, O. P., & N. D. Whipple, metal corrosion, 1009
Weatherburn, C. E., hydrodynamics, 139
Webb, H. A., & W. H. Barling, elasticity, 889
Weber, 101, 231, 453, 850
Weber, S., conductivity relation, 557; heat conductivity, 687, 688
Webster, D. L., 269, 549; magneton, 397
Weeks, P. T., X-rays, 164
Wegener, 145
Wehnelt, 193, 1265
Weibel, E. E., P. D. Foote, & F. Wenner, e.m.f. measurement, 559
Weibel, E. E., & A. L. Thuras, salinometer, 593
Weigel, O., optics of carborundum, 58
Weiland, H. J., & E. W. Washburn, electrolyte conductance, 433
Weinstein, M. B., 79; dilatation, 78; thermodynamics, 967
Weiser, H. B., electrolysis, 723; luminescence, 846
Weiss, 56, 200, 1123, 1277
Weiss, E., 1263
Weiss, H., curve analysis, 884

Weiss, P., 305, 871, 1191; ferromagnetism, 1122; fluid compression, 1176; large electromagnet, 302; paramagnetic salts, 304
Weiss, P., & A. Piccard, thermomagnetics, 991
Weld, Le R. D., & J. C. Steinberg, solution, 209
Wellisch, E. M., 551
Wells, P. V., periodic system, 802
v. Welsbach, C. A., 677
Wenner, F., P. D. Foote, & E. E. Weibel, e.m.f. measurement, 559
Wenzel, A., refraction, 45
Wenzel, A., & T. Liebisch, interference, 368
Wereide, T., atomic radiation, 550; electron theory, 969; magneton, 398
Weston, 717, 1118
Weyl, H., gravitation, 605, 908
Weyssenhoff, 798
Wheeler, R. V., gas ignition, 1262
Wheeler, R. V., & W. Mason, flame propagation, 176; gas inflammability, 283
Wheeler, R. V., & W. Payman, flame propagation, 1171
Whelan, P., & A. G. G. Leonard, spectra, 524
Whipple, N. D., & O. P. Watts, metal corrosion, 1009
White, 222
White, M[argaret] P., 682
White, M[argaret] P., & C. G. Barkla, X-rays, 166
White, W. P., calorimeter design, 537; heat convection, 281
Whitehead, A. N., high-angle fire, 598
Whiteley, J. H., pearlite, 1127
Whittemore, C. F., J. E. Underwood, & S. C. Lind, Ra SO_4 solubility, 534
Wick, [Miss] F. G., fluorescence, 527
Wick, [Miss] F. G., & [Miss] L. S. McDowell, luminescence, 1095
Wickham, R., & R. Desplats, radiology, 571
Wiechert, 1111
Wiechert, E., 346, 1212
Wiedemann, 520
Wiedemann-Franz, 103, 405, 1190
Wien, 82, 86, 386, 694, 879, 944
Wiesinger, H., oscillatory circuits, 980
Wilber, D. T., & H. L. Howes, fluorescence, 67
Williams, 200
Williams, A. M., adsorption, 813
Williams, C. M., X-rays, 1256
Williams, E. H., magnetic oxides, 1192
Williams, I., a.c. detector, 1117
Williams, S. R., conductivity, 1271
Willis, F. W., & C. A. Edwards, hardness, 886
Wilsey, R. B., & L. A. Jones, photography, 365
Wilson, C. T. R., 875
Wilson, H. A., 1186
Wilson, L[ucy], spectra, 369
Wilson, R. E., γ Phœnicis, 501
σ Puppis, 502
Witkowski, 1176
Witte, H., visual space, 732
Wolf, M., 25; new star, 39; proper motion stars, 504
Wolf-Rayet, 655, 1077
Wolfke, J., secondary rays, 948
Wolfke, M., canal rays, 68; secondary rays, 947, 1167
Wood, F. E., 694; Wien's law, 386
Wood, R. W., 47, 48, 63, 160, 162, 371, 1266; iodine spectra, 375; light-scattering, 1151
Wood, R. W., & M. Kimura, iodine spectra, 65; resonance spectra, 376; Zeeman-effect, 66
Wood, R. W., & F. L. Mohler, resonance radiation, 374
Woodcock, W. H., & B. Blount, vacuum balance, 214
Woolard, E., relativity, 898
Wordie, J. M., oceanography, 1148
Worthing, A. G., atomic heats, 850; dilatation, 276; temperature scale, 74
Wrede, 432
Wright, F. E., 574; microscope, 771
Wright, J. R., & G. W. Heise, radioactivity, 170
Wright, R., discharge, 97
Wright, W. R., magnetisation, 564
Wulf, 274

Yagi, H., resonance transformer, 222B
Yamada, K., objective, 1083
Yamamoto, I., latitude variation, 1037; Nova Aquilæ, 1066
Yatsevitch, high-speed steel, 805
Yélénko, M., earthquakes, 916
Yensen, T. D., 200; magnetic alloys, 623B
Yngve, V., & T. W. Richards, thermometry, 279, 313
Yntema, L. F., & B. S. Hopkins, holmium, 1198
Yoshida, U., 841, 1157; photography, 933
Yoshida, U., & T. Takamine, discharge, 866; Stark-effect, 839, 840
Young, 887, 1175, 1176, 1177
Young, S., 311

Zahm, 328
Zandt, J. P. Van, 137
Zeeman, 520
Zeeman, P., gravitation, 333
Zeiss, Rayleigh-, 54
Zernike, F., & L. S. Ornstein, density, 595
Zschokke, W., optical glasses, 831

SUBJECT INDEX.

SECTION A.—PHYSICS.

To facilitate reference to any desired subject, the Index is divided into the following sections arranged alphabetically. If any of these are absent this may be taken as an indication that no Abstracts dealing with those particular subjects have been included in this volume.

Where phenomena such as the Hall-effect, Thomson-effect, Zeeman-effect, etc., are mentioned in an Abstract but not in the Title, the reference will be found in the Name Index.

The numbers refer to Abstracts; if the letter B follows a number the Abstract will be found in Section B under that number

In General Physics:—Apparatus and Instruments (physical, excluding electrical, descriptive); Astronomy; Diffusion; Dynamics; Elasticity; Gravity; Measurements and Use of Instruments; Meteorology, &c.; Miscellaneous; Molecular Physics, Matter and Ether; Pressures (high and low); Surface Tension; Terrestrial Physics; Theories; Viscosity,

In Light:—Absorption; Dispersion; Interference; Lenses and Optical Systems; Measurements and Use of Instruments; Miscellaneous; Phosphorescence and Fluorescence; Photography; Photometry; Polarisation; Radio-activity; Rays and Radiation; Reflection of Light; Refraction of Light; Spectra; Vision; Zeeman-Effect and Radiation in an Electric or Magnetic Field.

In Heat:—Absorption; Conductivity; Critical Points and Constants; Dilatation; Freezing-, Melting-, and Boiling-Points; Gases and Vapours; Measurements and Use of Instruments; Miscellaneous; Specific Heat and Latent Heat; Temperature; Temperatures (high and low); Thermodynamics; Thermometry, Pyrometry, and Calorimetry; Vapour Pressure.

In Sound:—All Abstracts referring to this subject have been indexed under *Sound*.

In Electricity and Magnetism:—Absorption; Alternate-Current Research; Apparatus and Instruments (descriptive); Capacity (electrostatic); Conductivity and Resistivity; Dielectrics; Discharge in Gases and in Vacuo; Electromagnetic Theory; Inductance (self and mutual); Magnetism; Measurements and Use of Instruments; Electro-Physiology and Radiography; Miscellaneous; Oscillations and Waves; Polarisation (electric waves); Polarisation (electrolytic); Static and Atmospheric Electricity; Terrestrial Magnetism and Electricity; Thermo-Electricity and Thermo-Magnetism.

In Chemical Physics:—Absorption; Alloys; Batteries (primary); Batteries (secondary); Chemical Equilibrium; Dissociation and Ionisation; Electric Furnace Processes; Electrolysis; Electrolytic Analysis; Metallography and Properties of Metals; Miscellaneous; Osmosis; Solution and Solubility.

Abstract Nos.

Absorption (Chemical Physics).

Adsorption of Gases on Plane Surfaces of Glass, Mica, and Platinum. I. Langmuir 1279

„ , Thermodynamics of. A. M. Williams 813

Absorption (Light and Heat).

Atmosphere, Lower, Ultra-violet Transparency of. R. J. Strutt 466

Colour of Pigments & Paints, Optical Properties and Theory of. H. E. Merwin 834

Glass, Absorption, for Optical Pyrometers. P. D. Foote, F. L. Mohler, and C. O. Fairchild 60

Glasses, Clear and Cobalt-blue, Ultra-violet Transmission of. M. Luckiesh 921

Radiation of Heat and Light, *see* section Rays.

Röntgen Rays, Absorption of, *see* section Rays and Radiation.

Abstract Nos.

Absorption (Light and Heat), *continued.*
Scattering Media, Behaviour of, in fully diffused Light. H. J. Channon, F. F. Renwick, and B. V. Storr 665
Spectra, Absorption, *see* separate section.
Spectro-radiometric Investigation of Transmission of Various Substances. W. W. Coblentz, W. B. Emerson, and M. B. Long... 1149
Transmission Factors, Measurement of. M. Luckiesh and L. L. Mellor 922
Water-vapour Transparency to Low-temperature Radiation. F. E. Fowle 1086
„ -vapour, Absorption of Infra-red Radiation by. W. W. Sleator 1150

Alloys, *see also* section Metallography.
Aluminium and Selenium, Metallographic Investigation of System. M. Chikashige and T. Aohi 578
Aluminium-Zinc Alloys. O. Bauer and O. Vogel 118
Cadmium and Selenium, Metallographic Investigation of System. M. Chikashige and R. Hikosaka 579
Electrolysis of Alloys, *see* section Electrolysis.
Iron and Steel, *see* section Metallography.
Magnetic Properties of Alloys, *see* section Magnetism.
Metallography, *see* separate section.
Selenium and Antimony, Metallographic Investigation of System. M. Chikashige and M. Fujita 580
Tellurium and Aluminium, Metallographic Investigation of System. M. Chikashige and J. Nosé 577
Zinc and Selenium, Metallographic Investigation of System. M. Chikashige and R. Kurosawa 576

Alternate-Current Research.
Arc, Electric, *see also* section Discharge.
Boron Conductors, Breakdown Effect in. F. W. Lyle 797
Braun Tube with Glowing Kathode. C. Samson 983
Excess Voltage in D.C. Circuit without Self-induction. H. Chaumat 404B
High-tension Direct Current from A.C. Supply. H. Greinacher..... 405B
Howler Set, Oscillographic Study of. L. Pyle 886B
Induction Coil, Capacity-Potential Curves of. E. T. Jones 1269
Measurements, *see* separate section.
Oscillograms obtained with Braun Tube, Apparatus for Facilitating Interpretation of. G. C. Trabacchi 986
Reactive Volt-amperes, Theorem of Conservation of. E. Haudié, and M. Latour 117B
Resonance Transformer Circuits, Phenomena in. H. Yagi..... 222B
„ , Series and Parallel, Combination of. H. L. Dodge 870
Shunted Telephone, Audibility Factors of. G. W. O. Howe 532B
Skin-effect in Tubular and Flat Conductors. H. B. Dwight..... 985
Variable Electrical Systems, Theory of. H. W. Nichols 90
Wave Propagation and Einstein's Gravitation Theory. E. Vessiot... 900
„ -shapes, Recording of, by Ionising Action of Kathode Rays. E. Lübcke 116B

Apparatus and Instruments (Electrical, Descriptive).
Ammeter, Optical. P. D. Foote 406
Braun Tube with Glowing Kathode. C. Samson..... 983
Compass, Nemirovsky Localising. Mondain..... 419
„ , Special. Localisation of Projectiles. Angebaud 418
Converter of 3-phase into Direct Current. O. M. Corbino 861B
Dynatron, Description of. A. W. Hull 300B
Electromagnet for Medical Purposes, Design of. H. du Bois 995
„ , Large Laboratory. P. Weiss 302
Electrometer for Radio-active Investigations. II. [Miss] H. J. Folmer..... 408
Electron-discharge Apparatus 596B
Galvanometer, Vibration, for Low Frequencies. H. Schering and R. Schmidt 560

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Apparatus and Instruments (Electrical, Descriptive), *continued.*

Induction, Mutual, Standard of. A. Guillet 987
Interrupter, Galvanic. W. Kasperowicz..... 869
Ortho-diascope, Ropiquet's, for Localisation of Projectiles 417
Positive-ray Analysis, New Method of. A. J. Dempster..... 788
Rectifier, Selenium. H. Greinacher 561
Röntgen-ray Generating Outfit, Portable. W. D. Coolidge and C. N. Moore 572
„ -ray Tube, Hot-kathode, New Radiator Type of. W. D. Coolidge 415
Salinity, Sea-water, Electrical Instrument for Recording. E. E. Weibel and A. L. Thuras 593
Standard Cell, Thermoelectric. C. A. Hoxie 407
„ , New, of Current and Potential. C. T. Allcutt..... 562
Thermostat, High-temperature, Further Notes on. J. L. Haughton and D. Hanson 686

Apparatus and Instruments (Physical, excluding Electrical, Descriptive).

Balance Cases, Vacuum. B. Blount and W. H. Woodcock 214
Boiling-point Apparatus for Testing Mercury Thermometers. G. Dimmer 848
Calorimeter, Aneroid, for Specific and Latent Heats. N. S. Osborne 535
„ for Measuring Heats of Dilution. D. A. MacInnes and J. M. Braham 174
Density Measurements, Rapid, on Board Ship, Instrument for. A. L. Thuras 213
Differentiation, Machine for. K. Hürthle 325
„ , Mechanical. A. Elmendorf..... 326
Dilatometer, Registering Differential. P. Chevenard 536
Dividing Engine, New, for Ruling Diffraction Gratings. H. J. Grayson 212
Evaporimeter, Self-recording. A. McAdie 442
Hydrometer, New "Total-immersion." A. Angström and H. Pettersson..... 1
Hygrostat and its Management. R. Kempf 211
Hypsometer. R. Cozza 1207
Interferometers for Examination of Optical Systems. F. Twyman... 356
Load Extension Optical Indicator, Autographic. W. E. Dalby 447
Measuring Machine, Simple 441
Mercury Still, Silica-glass. J. C. Hostetter and R. B. Sosman 420
Microscope, Petrographic. F. E. Wright 771
Oceanographical Research, New Instruments for. H. Pettersson ... 327
Photometer for Measuring Photographic Densities. D. E. Benson, W. B. Ferguson, and F. F. Renwick 920
„ , New Stellar. M. Maggini 662
Pump, Condensation. W. C. Baker 215
„ , High-vacuum, Parallel Jet. W. W. Crawford 128
Pyrometers, Optical, *see also* section Thermometry.
Refractor, 40-inch Yerkes, Focal Length of. E. E. Barnard 511
Scale, Weighing, Stabilised Platform. F. J. Schlinck..... 724
Screen, Neutral-tint and Variable-tint. E. Karrer 772
Spectro-comparator, New Form of. R. E. De Lury 44
Spectrophotometer, Differential. G. A. Shook 355
Synthesiser, Harmonic. W. J. Raymond 1010
Thermometers, *see also* section Thermometry.
Thermostat, Sensitive Bath-. A. N. Shaw..... 954
Time-measurement to Thousandth of a Second. R. A. Sampson..... 1013
Transformation of Coordinates, Mechanical Device for. O. Srnka... 715B
Transit Instrument, New Photographic. F. Schlesinger 770
Vacua, High, Production and Measurement of. J. E. Shrader and R. G. Sherwood..... 444
Vacuum Gauge, Hot-wire, with Multiplier. W. Tschudy 883

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Apparatus and Instruments (Physical, excluding Electrical, Descriptive), *continued.*
Vibrations, Forced, experimentally Illustrated. E. H. Barton and H. M. Browning 1140

Astronomy.
Absorption, Optical. P. Debye 496
Aethra (132) Orbit of. [Miss] P. E. Glancy 476
γ Argus, Changes in Spectrum of. C. D. Perrine 641
Asteroid Groups probably of Common Origin. K. Hirayama 1050
„ Mean Motion Distribution, Why Gaps occur in. K. Hirayama 1051
Asteroids, Distribution of Mean Motions of. K. Hirayama 475
Astronomical Consequences, Einstein's Theory of Gravitation and. W. de Sitter 134
„ „ of Electrical Theory of Matter. Q. J. Lodge 135, 470
„ „ „ „ „ „ . G. W. Walker, A. S. Eddington, A. D. Fokker 919
Atom, Astronomical, and Spectral Series of Hydrogen. F. Sanford 1250
Aurora and Magnetic Storm of March 7–8, 1918 354
„ Borealis, Corpuscular Theory of. C. Störmer 150
„ , Photographic Determination of Height of. C. Störmer 505
Auroral Observations in the Antarctic. D. Mawson 661
„ Streamers, Observation of Apparent Focus of. C. C. Trowbridge 1080
Berkeley (716), Orbit and Perturbations of. F. J. Neubauer 490
Binaries, Three Spectroscopic, Orbits of. W. E. Harper 42
RS Boötis, Short-period Variable. C. Martin and H. C. Plummer ... 1062
V Boötis, Light-curve of. G. B. Lacchini 248
Boss 46, Spectroscopic Binary, Orbit of. W. S. Adams and G. Strömberg 1052
Brightness and Colour, Errors affecting Visual Estimations of. H. Osthoff 24
β Canis Majoris, Spectroscopic Study of. F. Henroteau 1054
α Canum Venaticorum, Spectrum of. C. C. Kiess 482
α2 Capricorni, Spectroscopic Binary, Orbit of. J. Lunt 756
U Cassiopeiæ, Cepheid Variable, Observations of. W. S. Adams and H. Shapley 640
Catathermic Phenomena at 1000° C. J. A. Le Bel 1079
α Centauri, Possible Drift Companion to. J. Voûte 23
RZ Cephei, Short-period Variable. C. Martin and H. C. Plummer... 483
Cluster, Globular, Dimensions of. H. Shapley 650
Clusters, Globular, and Structure of Galactic System. H. Shapley ... 651
„ , „ , Distances of. H. Shapley 1238
„ , Star, Magnitudes in. H. Shapley 1239
„ , „ , Radial Velocities of. V. M. Slipher 254
Collimation of Olcott Meridian Circle. A. J. Roy 43
Comet 1914c (Neujonin), Orbit of. J. Svardson 14
„ , Olber's, Perturbations of Orbit of. F. K. Ginzel 1053
„ , Wolf's, Spectrum of. V. M. Slipher 244
Coronal Spectrum, Chromospheric and, 1911 April 28. A. L. Cortie 748
Eclipse, Total Solar, 1919 May 28-29, Conditions for. A. R. Hinks 242
Fraunhofer Lines, Principle of Relativity and Displacement of. C. E. St. John 247
Galactic Condensation, Determination of. F. H. Seares 20
„ Co-ordinates. A. C. D. Crommelin 494
Gaseous Mass, Contraction of, A. Véronnet 634
„ „ , Law of Densities in. A. Véronnet 488
Gravitational Formula, Cowell's, Algebraic Derivation of. N. Liapin, S. Eddington 17
Hansen's Method, Hill's Formulæ in Use of. R. T. A. Innes 767
Jupiter, Motion in Longitude of Red Spot on. T. E. R. Phillips..... 1048

For the **Explanation** of this Index see p. 535.

Astronomy, *continued.* Abstract Nos.

Jupiter, Surface-currents of, 1917–18. S. Bolton 1047
Jupiter's Satellites, New Theory of. W. de Sitter 1049
Lunar Crater Eimmart. Maggini..... 638
Lunar Volcanoes, Physical History of. E. Belot..... 19
Magnitude Equation and Visual Scale. R. H. Tucker 765
„ of Cape Photographic Durchmusterung. J. Halm 657
Magnitudes, Apparent, and Star-counts, Relation between. J. Halm. 658
„ , Photographic, Determination of. J. Halm..... 760
„ „ , with Vatican Astrographic Equatorial H. H. Turner 645
Mercury, Perihelion Progress. O. Lodge, H. Jeffreys 636
Meteorites and Terrestrial Eccentricity. J. Bosler..... 499
„ , Photographic Spectra of. W. Crookes 489
„ , Fall of, in Perthshire 18
Meteors, Real Velocities of. C. P. Olivier..... 29
Mira Ceti, Maxima of. Nijland 40
„ „ , Observations of. G. B. Lacchini 249
„ , Spectrum of. W. S. Adams and H. A. Joy 1068
Moon and Planets, Absorption of Water on. A. Véronnet 243
„ , Resonance Theory of Origin of. H. Jeffreys..... 474
Nebula, Andromeda, Rotation of Central Part of. F. G. Pease 506
„ M51, Spiral, Canum Venaticorum, Structure of. L. Becker 34
„ , N. G. C. 1068, Spiral, Spectrum and Radial Velocity of. V. M. Slipher 659
„ , Orion, Pleiades, and Coma Berenices, Distances of. W. H. Pickering 1233
„ , Planetary, Jonckheere 900. R. Jonckheere..... 149
„ Ring in Lyra, Parallax of. A. van Maanen 255
„ „ „ , Parallax and Proper Motion of 26
Nebulæ, Atomic Weights of Elements in. J. W. Nicholson..... 762
„ , Planetary, Physical Study of. W. K. Grant 28
„ , „ , Preferential Motion of. C. D. Perrine..... 151
„ , Probable Number of. E. A. Fath 751
„ , Spiral, Absorption Effects in. H. D. Curtis 478
„ „ , Are they External Galaxies? A. C. D. Crommelin... 655
„ „ , Photographic Effective Wave-lengths of. K. Lundmark and B. Lindblad..... 148
„ Spiral, Structure and Motions of. V. M. Slipher..... 486
Northern Lights, Spectrum of. J. Stark..... 745
Nova Aquilæ. G. F. Paddock, W. S. Adams, and A. H. Joy 1230
„ „ (1918). H. Thomson, Laskovski, F. W. Dyson, A. Fowler, W. E. Harper, W. F. Denning, T. E. R. Phillips, P. Blanc, C. Easton, I. Yamamoto, Y. Ueta, A. L. Cortie, R. Jonckheere, F. de Roy and J. Bosler 1066
„ Aquilæ Spectrum. J. S. Plaskett..... 1231
„ Monocerotis..... 764
„ „ . G. F. Paddock 1071
„ Persei, Nebulous Ring about. G. W. Ritchey 492
„ „ (1901), Nebulosity about. F. G. Pease..... 485
„ Ritchey..... 25
„ „ . E[thel] F. Bellamy..... 508
„ , Faint, in Andromeda Nebula. H. Shapley 653
„ , Fifth, in Andromeda Nebula. G. W. Ritchey 495
„ , Suspected, in Spiral Nebula N.G.C. 2841. F. G. Pease 647
Novæ, High Velocities of, and "Whirlpool" Cosmogony. E. Belot... 1056
„ in Spiral Nebulæ. G. W. Ritchey..... 648
„ „ „ „ , Magnitudes of. H. Shapley 649
„ , Three, in Spiral Nebulæ. H. D. Curtis 27
Orbit Determinations, Preliminary, by Leuschner's Method. [Miss] A. E. Glancy 500
„ of (718) Erida. C. S. Mundt..... 491

For the **Explanation** of this Index see p. 535.

Abstract Nos

Astronomy, *continued.*
Orbit, Cusped, of Dr. Hill. R. Moritz 256
a Orionis, Variations of. T. W. Backhouse 498
γ and ε Orionis, Radial Velocities of. F. Henroteau 1226
P Ophiuchi, Parallax of. J. C. Solá 250
Ozone, Atmospheric, Absorption Bands of, in Spectra of Sun and Stars. A Fowler and R. J. Strutt 12
κ Pegasi, Spectrographic Study of. F. Henroteau 487
γ Phœnicis, Spectroscopic Binary, Orbit of. R. E. Wilson 501
Planetary Motion in Space-Time of any Constant Curvative. L. Silberstein 749
„ Motion (Undisturbed), Hodographic Treatment and Energetics of. A. Gray 477
Planets and Moon, Motion of, according to Einstein Gravitational Theory. J. Lense and H. Thirring 825
„ , Distances of, from Sun, Empirical Law connecting. E. Belot 13
„ , Inner, Secular Perturbations of. H. Jeffreys 1044
„ , Trojan, Libration of. W. M. Smart 639
Pleiades, Distance of. W. H. Pickering 769
„ , Photo-visual Magnitudes of Stars in. [Miss] H. McW. Parsons 642
„ , Stars in, not belonging to Physical System. J. A. Parkhurst 643
Polar Motion, Fourteen-months Component of, Variations in. H. Kimura 484
Polaris, Absolute Parallax of. A. E. Glancy 752
Proper Motions with Blink Microscope. R. Innes 32
Progress, Recent, in Astronomy. A. de la Baume Pluvinel 11
σ Puppis, Spectroscopic Binary, Orbit of. R. E. Wilson 502
Radial Velocity and Absolute Magnitude. W. S. Adams and G. Strömberg 1076
Radial-velocity Determinations with Objective Prism. M. Hamy ... 1055
Radiative Transfer of Energy, Equations of. J. H. Jeans 251
Refraction, Atmospheric. W. T. Neill 245
„ „ , Determination of Coefficient of, based on Meteorological Elements. V. Reina 738
„ , Atmospheric, Diurnal Variation in. R. H. Tucker 766
Refractor, 40-inch Yerkes, Focal Length of. E. E. Barnard 511
σ Scorpii, Spectrographic Study of. F. Henroteau 1227
Sirius, Orbit of. R. G. Aitken 1235
„ , Period of. R. Jonckheere 1072
Solar Atmosphere, Absorption and Radiation of. S. Hirayama 632
„ Coronæ: Five Years' Recent Observations. J. Maurer 626
„ Hydrogen "Bombs." F. Ellerman 349
„ Images, Diffraction of. M. Hamy 1046
„ Motion and Stream Motion from Stars of Late Spectral Types. G. Strömberg 646
„ Prominences, East and West Asymmetry of. J. L[armor] 473
„ Spectrum and Water-vapour Band λ3064. A. Fowler 936
„ „ from λ6890 to λ9600, Photography of. W. F. Meggers 631
„ „ , Supposed Abnormal, Explanation of. G. E. Hale ... 347
„ „ , Ultra-violet Band of Ammonia and its Occurrence in. A. Fowler and C. C. L. Gregory 937
„ System, Evolution of. H. Jeffreys 1224
„ „ , Mechanical Model of Formation of. E. Belot 830
„ Variation, Periodicity in. C. G. Abbot 1061
Space, Curvature of. W. de Sitter 16
„ , Physical Laws and Dimensions of. P. Ehrenfest 136
„ , Visual. H. Witte 732
Star Colours, Scales for. T. W. Backhouse 1234
„ -counts on Harvard Map. H. Nort 1232

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Astronomy, *continued.*

Star-counts and Visual Magnitude Scale. R. H. Tucker 1070
„ , Binary, A 417 = 83 Aquarii, Orbit of. R. G. Aitken 1228
„ , „ , Σ 2026 (B 7561), Orbit of. G. C. Comstock 509
„ , Bright Variable, in N.G.C. 6779 (Messier 56). H[elen] Davis 652
„ , Condensing, Maximum Temperature of. A. Véronnet 1059
„ , Faint, in Aquarius, Motion of. C. O. Lampland..... 768
„ , „ , near *a* Centauri, Proper Motion and Parallax of. R. Innes 246
„ , Moving, is it retarded by Reaction of its Own Radiation ? L. Page 471
„ , New, in Spiral Nebula N.G.C. 6946. M. Wolf 39
„ , Physical Conditions in Interior of. A. S. Eddington..... 253
„ Positions, Photographic, by Nomonic Rulings. R. Innes..... 31
„ , Variable, B. D. + 56·547°, Photographic Magnitudes of. C. Martin and H. C. Plummer..... 33
Starlight, Intrinsic Brightness of. H. Bourget..... 1057
Stars and Planets, Dwarf, Compressibility of. H. Jeffreys..... 656
„ of Different Spectral Types, Mean Distances of. S. Hirayama 1069
„ with Small Proper Motions and Large Radial Velocities. C. D. Perrine..... 30
„ , Brighter Galactic Helium, Parallaxes and Motions of. J. C. Kapteyn 1229
„ , Cause of Spectral Conditions of. C. D. Perrine 758
„ , „ Underlying Spectral Differences of. C. D. Perrine..... 1077
„ , Colour Scale for. W. H. Pickering..... 38
„ , Concentration of, toward Galaxy. F. H. Seares 35
„ , Contraction of, and Equilibrium of Nebulæ. A. Véronnet ... 1058
„ , Density of, in Reference to their Galactic Co-ordinates. F. W. Dyson and W. G. Thackeray 22
„ , Double, Dependence of Spectral Relation of, on Distance. C. D. Perrine 757
„ , 500, Luminosities and Parallaxes of. W. S. Adams and A. H. Joy 350
„ , Fixed, Applicability of Kinetic Theory of Gases to System of. J. Lense 1067
„ , Gaseous, Evolution and Radiation of. J. H. Jeans 252
„ , Hydrogen, Absorption in Spectrum of. J. Hartmann..... 497
„ , Long-period Variable, Classification of. H. H. Turner 507
„ , Masses of. H. N. Russell 481
„ , New Variable. E. C. Pickering 503
„ , Number and Galactic Distribution of. S. Chapman 353
„ , „ of, of different Magnitudes in Hyderabad Catalogue. R. J. Pocock 763
„ , Number of, of each Photographic Magnitude in different Galactic Latitudes. P. J. van Rhijn..... 493
„ , Pole, Position of, and Constant of Aberration. L. Becker ... 37
„ , Precession-constant and Systematic Proper Motions of. C. de Jong 1065
„ , Proper-motion. M. Wolf 504
„ , Radiative Equilibrium of. F. A. Lindemann 479
„ , Real Motions of. B. Boss 1074
„ , Southern, Magnitude Distribution of. J. Halm 761
Stellar Currents. J. C. Sola.....750, 1064
„ Distance, Unit of. de R. Pailhade 510
„ Evolution and Finite Velocity of Gravitation. D. Alter..... 480
„ „ . W. D. MacMillan 1237
„ Images, Photographic, Influence of Development on. F. E. Ross 52
„ Magnitude Scales of Astrographic Catalogue. H. H. Turner 352
„ Motions, Cause of Distance-Velocity Equation in. C. D. Perrine..... 1075

For the **Explanation** of this Index see p. 535.

Abstract Nos

Astronomy, *continued.*
Stellar Parallax, Photographic Determinations of. A. C. D. Crommelin 654
„ Preferential Motion and Spectral Class, Relation of, to Proper Motion. C. D. Perrine 41
„ Radial Velocities, Determination of, with Objective Prism. T. S. H. Graham 759
„ Spectra, Changes of Wave-length with Change of Type in. F. E. Baxandall 1236
„ Systems, Meteoritic Exchange of Solid Matter between. E. Belot 152
„ Universe, Monastic and Dualistic Conceptions of. C. V. L. Charlier, J. H. Jeans 36
„ Universe, Spiral of Obscuration in. H. H. Turner, F. H. Seares 21
„ Wave-lengths, Changes in, Dependent on Type. J. Voûte ... 755
Sun, Accumulated Energy from Contraction of. Auric 1225
„ , Brester's Theory of. A. Brester 15
„ , Contraction and Evolution of. A. Véronnet 1045
„ , General Magnetic Field of. G. E. Hale, F. H. Seares, A. van Maanen, and F. Ellerman 1078
„ , Internal Temperatures of. A. Véronnet 633
„ -spots, Magnetic Storms, and Faculæ. H. Arctowski 201
„ , Secular Acceleration of, from Hipparchus' Equinox Observations. J. K. Fotheringham 747
„ , Temperature and Radiation of. F. Biscoe 348
Sun's Magnetic Axis, Location of. F. H. Seares, A. van Maanen, and F. Ellerman 472
„ Surface, Refraction on, and Height of Calcium Flocculæ. P. Kempf 746
W Ursæ Majoris, Colour Curve and Light-elements of. H. Shapley and J. Van Der Bilt 351
„ Minoris, Eclipsing Variable. C. Martin and H. C. Plummer 1063
Variables, Cepheid, Pulsation Theory of. F. A. Lindemann 1060
„ , „ , Spectral Characteristics of. W. S. Adams and A. H. Joy 1073
„ , Short-period, Light-curves of. T. E. R. Phillips 644
Venus, Physical Observations of, in 1917. R. Innes 637
W Virginis, Variable, Light-curve of. C. A. Chant 660

Batteries, Primary.
Activities of Two Typical Electrolytes, Comparison of. G. A. Linhart 439
Bromine Electrode, Potential of. G. N. Lewis and H. Storch 438
Chloride Electrodes, Potentials of. A. A. Noyes and M. Chow 1136
Copper-Nickel Series of Alloys, Potential Measurements on. N. T. Gordon and D. P. Smith 716
Depolarisation by Sulphur Dioxide. M. de K. Thompson and A. P. Sullivan 437
Electrolytic Cell, P.D. of, Influence of Magnetic Field and of Stirring on. T. Mashimo 1008
Hydrogen and Calomel Electrodes, Study of. G. N. Lewis, T. B. Brighton, and R. L. Sebastian 321
Lead Electrode. II. F. H. Getman 815
Leclanché Cell, Depolarisation of. F. E. Hackett and R. J. Feely ... 717
Nickel, Electrochemical Behaviour of. A. Smits and C. A. L. de Bruyn 440
Photochemical Cell, Cuprous-Oxide. T. W. Case 1007
Polarisation, *see also* section Polarisation (Electrolytic).
Potential of Metal in Electrolyte. D. L. Ulrey 1137
Potentials, Electro-chemical Normal, Calculation of. K. F. Herzfeld 1205
Standard Cell, Lead, and Determination of Potential of Lead Electrode. W. E. Henderson and G. Stegeman 323

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Batteries (Primary), *continued.*
Weston Normal Cell. J. Obata 1118
" " " Comparisons. J. Obata 981
Zinc Electrode, Sign of. W. D. Bancroft 1006

Batteries, Secondary.
Accumulators, Industrial Electrical, *see* Section B.
Edison Storage Battery, Effect of Lithium upon Capacity of. L. C. Turnock 839B
Lead Accumulator, Theory of. C. Féry 324

Conductivity (Electric) **and Resistivity.**
Boron Conductors, Breakdown Effect in. F. W. Lyle 797
Conductance, Electrical, of Solutions in Bromine. E. H. Darby 434
" , Equivalent, in Dilute Solution. H. J. Weiland and E. W. Washburn 433
Conduction, Electrical, in Metals at Low Temperatures. F. B. Silsbee 1187
Conductivities, Electrical and Thermal, of Metals, Relation between. S. Weber 557
Conductivities, Thermal and Electrical, of Carbon Steels. T. Simidu 102
" " " " K. Honda and T. Simidu 405
Conductivities, Thermal and Electrical, of Nickel Steels. K. Honda 1190
Conductivity of Atmosphere, *see also* section Static Electricity.
" , Electric, of Metals according to Grüneisen's Theory; Influence of Pressure. B. Beckman 100
Conductivity, Electrical, of Aqueous Salt Solutions. J. C. Ghosh ... 881
" , " , of Vertically Suspended Wires. S. R. Williams 1271
" , Electrical, of Spluttered Films. R. W. King 101
Ionisation, *see* sections Dissociation and Ionisation and Discharge, Electric.
Iron Oxide, Electrical and Thermal Properties of. C. C. Bidwell ... 300
Measurements, *see* separate section.
Resistance of certain Novel Conductors. K. Lichtenecker 1272
" of Monatomic Metals, Change in, with Temperature. E. Grüneisen 1273
" , Specific, and Thermoelectric Power of Calcium. C. L. Swisher 299
Resistivity, Electrical, Influence of Temperature on, in Steels. E. D. Campbell 1119
" , Electric, of Carbon; Effect of Hydrogen. T. Peczalski 867
Steel Influence of Heat Treatment on Electrical Properties of. E. D. Campbell and W. C. Dowd 197
Wiedemann-Franz Ratio, Experimental Test of, through Change of State. E. F. Northrup and E. R. Pratt 103

Conductivity (Thermal).
Conductivities, Electrical and Thermal, of Metals, Relation between. S. Weber 557
Gases, Experimental Researches on Thermal Conductivity of. I and II. S. Weber 687
Gas Mixtures, Experimental Researches on Thermal Conductivity of. III. S. Weber 688
Heat Convection in Air, and Newton's Law of Cooling. W. P. White 281
Measurements, *see* separate section.
Metals, Thermal Conductivity in. E. H. Hall 849
Steels, Nickel, Thermal and Electrical Conductivities of. K. Honda 1190
Wiedemann-Franz Ratio, Experimental Test of, through Change of State. E. F. Northrup and F. R. Pratt 103

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Critical Points and Constants.
Hydrogen, Preliminary Determination of Critical Point of. H. K. Onnes, C. A. Crommelin, and P. G. Cath 285
Measurements, *see* separate section.
Mercury and Phosphorus, Critical Temperature and Pressure of. J. J. van Laar 75
„ , Critical Constants of. E. Ariès 546
Dielectrics, *see also* section Capacity.
Dielectric Constant and Refractive Index, Maxwell's Relation between. Method for Estimation of Ionic Charge in Crystals. M. Born 972
Electrolyte, Relation between Specific Inductive Capacity of, and Potential of Metal placed in it. D. L. Ulrey 1137
Measurements, *see* separate section.
Metals, Specific Inductive Capacity of. F. Sanford 1181
Mica, Electric Conductivity of. É. Branly 104
„ , Thin Sheets of, Electro-metallic Effects exerted through. E. Branly 105
Mixtures, Dielectric Constants of. W. John 982
Porcelain, Electrical Resistance of, at different Temperatures. R. G. Allen 620B
Solids, Dielectric Constants of. R. Jaeger 404
Diffusion.
Principles of Diffusion, their Analogies and Applications. H. T. Brown 893
Dilatation.
Quartz, Expansion Coefficient of, Parallel to Axis. S. Nakamura ... 955
Solid Bodies, Regular Crystallising, Thermal Expansion of. E. Grüneisen 1105
„ Bodies, Thermal Expansion of, and Nernst Theorem. M. B. Weinstein 78
Steels, Thermal Expansion of, at High Temperatures. K. Honda ... 538
Tungsten, Thermal Expansion of, at Incandescent Temperatures. A. G. Worthing 276
Discharge in Gases and in Vacuo (Electric), including Discharge of Condensers; *see also* section Rays.
Absorption, Gas, *see also* section Absorption.
Amplifier, Thermionic, Theory of. H. J. van der Bijl 1267
Anode Resistance Films. J. T. Tate & P. D. Foote 193
Arcs under Pressure, Further Investigations with. W. Mathiesen ... 217B
Argon-Nitrogen Mixtures, Sparking Potential of. G. Holst and A. N. Koopmans 794
Brush Discharges, Gliding. M. Toepler 555
Canal Rays, *see* section Rays.
Conduction of Electricity in High Vacua. J. E. Lilienfeld 401
Corona Discharge, Pressure Effect in. A. M. Tyndall and [Miss] N. S. Searle 402
Corona, Direct-current, Influence of Series Spark on. S. J. Crooker 703
Corona, Pressure-increase in. E. H. Warner 98
Crookes' Dark Space in Narrow Tube, Distribution of Electric Field in. T. Takamine and U. Yoshida 866
Duddell Currents, *see* sections Alternate-Current Research and Oscillations.
Electrons, Emission of, by Metal when Bombarded by Positive Ions. W. L. Cheney 95
Gases and Gas Mixtures, Light Emission of, by Electric Discharges. L. Hamburger 793
Glow Discharge, Equipotential Surfaces in Positive Light Column of. H. Salinger 556
Glow Discharge, Striated Positive. P. Neubert 400
Impact of Electrons with Gas Molecules, Elasticity of, J. M. Benade and K. T. Compton 553

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Discharge in Gases and in Vacuo (Electric), including Discharge of condensers, *continued.*

Induction Coil, Capacity-Potential Curves of. E. T. Jones 1269
Ionisation and Resonance Potentials for Sodium Vapour. J. T. Tate and P. D. Foote..... 63
„ by Collision, Application of Thermionic Currents to Study of. F. Horton 96
„ in Geissler Tubes, Measurement of. E. Rumpf..... 297
„ of Gases. H. Greinacher..... 864
„ Potential of Mercury Vapour. T. C. Hebb..... 552
„ with reference to Light Emission in Positive Layer. O. Hardtke 1161
„ , Total, by Slow Electrons. J. B. Johnson..... 295
Ionising Potentials of Gases. A. L. Hughes and A. A. Dixon 191
Ions, Gaseous, Nature of. L. B. Loeb 551
Kathode-fall in Gases, Theory of, with Application to Plates and Wires. C. A. Skinner..... 1186
„ Rays, Effect of Magnetic Field upon. L. T. More and L. M. Alexander 1116
„ Rays, Origin of. E. Meyer and H. Schüler..... 1265
Luminosity of Electric Discharge in Gases, Duration of. R. J. Strutt 194
Magnetic Field, Transverse, Effect of, on Discharge. J. E. Ives ... 1268
„ Phenomena at Anode. G. Gouy 298
Magneto, High-tension, Potential Generated in. E. T. Jones 728B
Mobilities of Gaseous Ions. Kia-Lok Yen..... 863
„ Ions in Air, Hydrogen, and Nitrogen. Kia-Lok Yen... 789
„ „ Vapours. Kia-Lok Yen 790
Ozone Formation. Chemical Reactions in Corona. F. O. Anderegg 205
Photo-electric Cell, Potassium, Time Variation of. H. E. Ives..... 296
„ Effects, Normal and Selective, Emission of Electrons in. A. L. Hughes..... 94
„ Effects on Mercury Droplets. J. B. Derieux 787
„ Sensitivity of Various Substances. W. W. Coblentz and W. B. Emerson..... 93
Polarisation Measurements at Wire Kathodes in Ionised Gases. C. A. Skinner 1185
Positive-ray Analysis, New Method of. A. J. Dempster..... 788
Quenched Spark. V. Pieck 554
Resistance of Electric Spark. F. Beaulard 792
Ring Discharge, Electrodeless. A. Hagenbach and W. Frey 192
Sodium Vapour, Low-voltage Discharge in. P. D. Foote and F. L. Mohler..... 1266
Spark-lengths in Gases and Vapours. R. Wright 97
Vacuum Tubes, Adsorption in. W. D. Bancroft..... 865
Vapours, Salt, Electric Conductivity of. G. C. Schmidt..... 1184
"Vosmaer Phenomenon." W. C. Moore 702
X-ray Tubes, Dynamical Characteristics of. N[ella] Mortara 196

Dispersion (Light).

Drude Dispersion Theory from Standpoint of Bohr's Model. A. Sommerfeld 520

Dissociation and Ionisation.

Cryoscopic Measurements, *see* section Freezing-, Melting-, and Boiling-Points.
Ionisation due to Electric Discharge, *see* section Discharge.
Ionisation of the Atmosphere, *see* section Static Electricity.
Ionisation Process, Mechanism of. J. Kendall and J. E. Booge 320

Dynamics and General Mechanics.

Absolute Motion, System of Reference for. P. Appell 901
Analogies, Mechanical, Action of Coupled Circuits and. H. C. Plummer..... 138

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Dynamics and General Mechanics, *continued.*

Analogy, Mathematical, between Optical Problem concerning Moving Media and Aeronautical Exercise. P. Frank 332
Artillery Calculation, Long-range. G. Greenhill..... 597
Ballistics, Internal. A. G. Hadcock..... 896
n-Bodies, Singularities in Solution of Problem of. I. E. Freundlich 617
Bubbles, Pressure due to Collapse of. Rayleigh..... 5
Canonical Equations of Dynamics and Hamilton's Principle. A. Einstein 455
Discharge of Gases under High Pressures. L. Hartshorn..... 223
Einstein's Gravitational Equations, Analogy between Fundamental Electromagnetic Equations and. H. Thirring..... 907
Gravitation Field, Energy of, in Einstein's Theory. G. Nordström... 1019
„ Theory of Einstein, Mass of Material System according to. G. Nordström 822
„ Theory, Einstein's, I, II, III, IV. H. A. Lorentz 729
„ , Einstein's Theory of, and its Astronomical Consequences. W. de Sitter 134
„ , Relative Theory of, from Standpoint of Scalar Potential. J. Ishiwara 909
„ , Theory of. H. Weyl 605
Gravitational Equations, Examination of de Sitter's Solution of. A. Einstein 607
„ Equations, General Covariant, Solution System of. E. Schrödinger 452
„ Field Equations, Derivation of. F. Jung 608
„ „ , Energy Components of. E. Schrödinger 331
„ „ „ „ . H. Bauer..... 824
„ „ , Remarks on Schrödinger's Paper on. A. Einstein 728
„ Theory, Einstein, Influence exerted on Motion of Planets and Moon, according to. J. Lense and H. Thirring 825
„ Theory, Einstein's, Physical Basis of. F. Kottler 1213
„ Waves. A. Einstein 606
Guns, Long-range. A. Mallock 448
Gyroscopic Phenomenon, New. E. E. T. Hinde..... 600
High-angle Fire, Graphical Solution for. A. N. Whitehead..... 598
Hydrodynamics of Relativity. C. E. Weatherburn 139
Kinematics, Fundamental, of Physical Wave of Elementary Vibration Form. III. K. Uller..... 225
Lagrange Equations, Generalised, for Non-holonomous Coordinates, Simple Deduction of. C. Schaefer 616
Liquid having Two-dimensional Flow, Stream Lines and Level Surfaces of. O. Tumlirz 602
Mass, Moving, is it Retarded by Reaction of its own Radiation? L. Page 823
Mechanical Theories of Electromagnetic Field. A. Korn.....88, 186, 396, 911, 912, 1026
Motion of Light Spherical Ball in Air. P. Appell 1025
„ , Two-dimensional, of Infinite Liquid. W. G. Bickley..... 821
„ , „ , „ „ produced by Rotation of Solid. J. G. Leathem 334
„ , Two-dimensional Fluid, Past an Obstacle of Curved Outline. J. G. Leathem 456
Moving Bodies possessing Rotatory Motions; Influence of Air-resistance. Z. Carrière 224
Oscillating Systems damped by Resistance as Square of Velocity. J. P. Van Zandt 137
Oscillations in Irregularly Variable Field of Force. A. Schmidt..... 451
Parachute, Stability of. S. Brodetsky..... 1139
Potential Problems, Some Two-dimensional, connected with Circular Arc. W. G. Bickley 1021

For the **Explanation** of this Index see p. 535.

Dynamics and General Mechanics, *continued.* Abstract Nos.

Projectiles, Flight of. F. Burzio ... 133
„ in Rotation, Influence of Air-resistance on. P. Appell... 328
Relativity. A. Palatini ... 144
„ Dynamics of Electron. M. N. Saha ... 1217
„ Formulæ. C. Cailler ... 140
„ Postulate, Physical Significance of: Einstein's New and Original Theories of Relativity. E. Kretschmann ... 457
„ , Energy Principle in General Theory of. A. Einstein ... 906
„ , General, without Equivalence Hypothesis. L. Silberstein 910
„ , Generalised, and Gravitation. E. Woolard ... 898
„ , Gravitation and Principle of. A. S. Eddington ... 905
„ , Principal Points of General Theory of. A. Einstein ... 897
Rotating Distant Masses, Action of, in Einstein's Gravitational Theory. H. Thirring ... 449
Similitude and Homogeneity, Extension to Physics of Principles of. P. Straneo ... 1214
Space, Curvature of. W. de Sitter ... 16
„ , Physical Laws and Dimensions of. P. Ehrenfest ... 136
Spinning-top in Harness. G. Greenhill ... 604
Stokes' Law, Cunningham's Correction to. I[rene] Parankiewicz ... 1211
Trajectories of Anti-Aircraft Shells, Formulæ for. G. Manetti ... 1022
Velocity-distribution Law, Maxwell, Simple Derivation of. R. v. Mises ... 610
Vibrations, Variably-coupled. II and III. E. H. Barton and H. M[ary] Browning ... 335, 894
Water-hammer in Conduits, Theory of. C. F. Mancini ... 601
Wave Motion on Water, Theory of. G. Greenhill ... 734
„ Propagation and Einstein's Gravitation Theory. E. Vessiot... 900
Waves in Deep Water due to Motion of Submerged Bodies. G. Green ... 902
„ , Periodic Irrotational, of Finite Height. T. H. Havelock ... 1145
„ , Rankine Trochoidal. G. Greenhill ... 731
„ , Variation of Velocity of, due to Motion of Source. D. Alter 1146
Whirling and Whip of Revolving Shaft. G. Greenhill ... 603

Elasticity, *see also* section Metallography.

Beams and Plates, Rigid Demonstration of Formulæ for. Mesnager 220
„ , Curved, Stresses in. J. J. Guest ... 1138
„ , Laterally Supported, Strength of. H. Kayser ... 885
Brinell Ball-hardness Test. Guillery ... 219
„ Hardness, Maximum Stress, and Elongation, Relationship of Impact Value to. G. Berndt ... 888
Columns, Large Bridge, Tests of. J. H. Griffith and J. G. Bragg ... 1018
„ , Long, carrying Distributed Loads. A. Morley ... 599
Compound Stresses, Fluctuating, Failure of Ductile Materials under. H. A. Webb and W. H. Barling ... 889
Crystalline Cylinders, Stress-Strain Relations in. P. W. Bridgman... 596
Glass Threads, Expansion of. M. So ... 1260
Hardness of Metals, Determination of, by Impact. C. A. Edwards and F. W. Willis ... 886
„ , Definition of. W. C. Unwin, F. Buckingham ... 817
„ , „ . R. M. Leslie ... 1015
Indentation, Elastic, of Steel Balls under Pressure. C. A. Briggs, W. C. Chapin, and H. G. Heil ... 887
Palladium charged with Hydrogen, Elasticity Ratios of. K. R. Koch 445
Pin Joints, Design of, based on Ultimate Strength. W. A. Scoble ... 733
Resilience, New Experiments on Shock Tests and on Determination of. G. Charpy and A. Cornu-Thenard ... 129
Small Bodies, Measuring Elastics of. C. Barus ... 218
Springs, Thermodynamics of. H. Bock ... 1107
Stresses. R. F. Gwyther ... 819
Struts and Structures, Critical Loading of. W. L. Cowley and H. Levy 890

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Elasticity, *continued.*
Surface Plane Waves, Elastic. K. Uller 1212
Torsion Problems, Use of Soap-films in Solving. A. A. Griffith and G. I. Taylor 221
Tubes under Pressure, Thickness of Wall for. M. Suwalski 1017
Tungsten, Variation of Elasticity of, with Temperature. H. L. Dodge 727

Electric Furnace Processes.
Industrial Processes, *see* Section B.
Melting-points, *see* separate section.
Temperature Uniformity in Electric Furnace. J. B. Ferguson 1283

Electrolysis.
Alloys, Electrolytic Deposition of. VIII. Iron and Iron-Nickel. R. Kremann and H. Breymesser 592
Alternating-current Electrolysis with Mercury Electrodes. H. B. Weiser 723
Analysis, Separation, and Estimation (Electrolytic), *see* section Electrolytic Analysis.
Antimony, Electro-deposition of, from Fluoride Baths. F. C. Mathers, K. S. Means, and B. F. Richard 721
„ , Plating Baths, Tests of. F. C. Mathers and K. S. Means 720
Corrosion of Metals by Acids. O. P. Watts and N. D. Whipple 1009
Cyanide Plating Solutions, Evolution of Hydrogen from. O. P. Watts and A. Brann 722
Endosmose, Electrical. T. R. Briggs, H. S. Bennett, and H. L. Pierson 880
Industrial Electrolysis, Plating and Refining, *see* Section B.
Passivity of Chromium. I. A. H. W. Aten 814
„ „ . II. A. H. W. Aten 882
Plating, Baths. Essential Oils as Addition Agents in. F. C. Mathers and A. B. Leible 719
Polarisation (Electrolytic), *see also* separate section.
Rectifier, Electrolytic, *see also* section Polarisation (Electrolytic).
Tungsten, Electrolytic Behaviour of. W. E. Koerner 718
Voltameter, Silver, Anode Complications in. J. Obata 563

Electrolytic Analysis.
Rare Earths, Electrolysis of Solutions of. III. L. E. Dennis and A. B. Ray 322
Vanadic Acid, Application of Rapidly Rotating Reductors in Estimation of. F. A. Gooch and W. Scott 1206

Electromagnetic Theory.
Analogy, Formal, between Fundamental Electromagnetic Equations and Einstein's Gravitational Equations. H. Thirring 907
Astronomical Consequences of Electrical Theory of Matter. G. W. Walker, A. S. Eddington, A. D. Fokker 919
Atomic Hypothesis, Bohr's. G. A. Schott 1216
Atoms and Electromagnetic Theory. A. C. Crehore 1108
Charges, Electric, on Spherules of Sulphur and Mercury determined from Fall Speeds and Colours. I[rene] Parankiewicz 188
Constant Current-element in Biaxial Anisotropic Medium, Electromagnetic Field of. M. Brillouin 87
Continuous Distributions of Electricity, Motion of. H. Bateman ... 974
Corpuscular Nature of Electricity. R. Bär 971
Divisibility of Electricity. F. Ehrenhaft 979
Doublet, Electric, in Biaxial Anisotropic Medium, Electromagnetic Field of. M. Brillouin 973
Electrodynamics, Theory of. R. Malmström 80
Electron Charge Experiments by I. Parankiewicz. R. Bär 1263
„ „ from Droplets, Possible Error in. A. Schidlof 785
„ . Theory of Metals. T. Wereide 969
„ , Lorentz, Electromagnetic Inertia of. G. A. Schott 1111

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Electromagnetic Theory, *continued.*
Electron, Radius of, and Nuclear Structure of Atoms. J. W. Nicholson 292
„ , Relativity Dynamics of. M. N. Saha 1217
„ , Size and Shape of. A. H. Compton 549, 784
Electronic Charge. I[rene] Parankiewicz 395
„ „ and Radiation Constants. L. Flamm 185
„ Rings, First and Second, of Atom. J. Kroo 1110
Electrons, Impact of, with Gas Molecules, Elasticity of. J. M. Benade and K. T. Compton 553
Energy Flux in Electrodynamic Field. G. H. Livens 184
Field, Electromagnetic, Mechanical Theories of. A. Korn...88, 186, 396, 911, 912, 1026
„ , „ , of Moving Electric Doublet. K. Tamaki ... 1112
„ , „ , Structure of. H. Bateman 975
Force, Maximum, between two Coaxial Circular Currents, Calculation of. H. Nagaoka 705
Fundamental Concepts of Electrical Theory. H. Bateman 187
Gravitation and Electricity. H. Weyl 908
h, "X-ray" determination of. F. C. Blake and W. Duane 291
Induction, Electromagnetic, and Relative Motion. S. J. Barnett 547, 1180
„ , Unipolar, and Electron Theory. G. B. Pegram 290
Ionic Charge in Crystals, Method for Estimation of. M. Born 972
Irregular Assemblages of Pulses and their Actions on Resonators. T. Terada 158
Magnetic and Electric Fields due to Rotation of Conducting Sphere. W. F. G. Swann 548
Magneton as Function of Planck Constant. T. Wereide 398
„ , Parson, Experimental Evidence for. L. O. Grondahl ... 108
„ Hypothesis, Parson, Scattering of α Particles as Evidence on. D. L. Webster 397
Mass, Electromagnetic, of Crystals. M. Born 1109
Maxwell's Equations and Atomic Radiation. T. Wereide 550
Optical Signal, Speed of, in Absorptive Medium. A. Schidlof 1084
Plane Electromagnetic Wave, Diffraction of, by Perfectly Conducting Sphere. J. Proudman, A. T. Doodson, and G. Kennedy ... 195
Potential Differences induced in Moving Wire by Earth's Magnetic Field. C. Barus and M. Barus 786
„ Theory, Problems of. A. Bolliger 293
Relationship between Gravitation Constant and Fundamental Quantities of Electrical Theory. A. Haas 1020
Riemann's Hypothesis, Extension of. R. Malmström 820
Variable Electrical Systems, Theory of. H. W. Nichols 90

Electro-Physiology and Radiography.
Antidiffuser, Elimination of Secondary Radiation in Radiography. Tauleigne and G. Mazo 800
Control of Apparatus used in Radiology. T. Nogier 994
Coolidge Tube, Characteristic of. F. Klingelfuss 1125
Diathermy: Use of Current to raise Temperature in Treatment of Disease. E. P. Cumberbatch 996
Dosimeter in X-ray Therapy, Choice of Best Radiation. H. Guilleminot 416
Dosimetry in X-Radiotherapy in Army. Guilleminot 307
Electromagnet for Medical Purposes, Design of. H. du Bois 995
Extracting Foreign Bodies, New Method of. Mazérès 203
Fluorometric Apparatus, New, for measuring Doses of Röntgen Rays. H. Guilleminot 308
Localisation of Foreign Bodies by Tauleigne-Mazo Radiostereometer 204
„ of Projectiles. Special Compass. Angebaud 418
Localiser, Radioscope. C. Ropiquet 799
Ortho-diascope, Ropiquet's, for Localisation of Projectiles 417

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Electro-Physiology and Radiography, *continued.*
Radiology, Practical, in Army. R. Desplats and R. Wickham 571
Region of Greatest Therapeutical Effect in Ultra-violet Spectrum. C. A. Schunck 573
Röntgenographic Materials, Sensitometry of. M. B. Hodgson 773
Röntgen-ray Generating Outfit, Portable. W. D. Coolidge and C. N. Moore 572
„ Tube, Hot-kathode, New Radiator Type of. W. D. Coolidge 415
Single-impulse (Instantaneous) Photography. R. Knox 997
Uni-directional H.T. Current, Obtaining, from Three-phase Current. O. M. Corbino and G. C. Trabacchi 1124
Unit of Quantity, Radio-therapeutic. H. Bordier 1196
X-ray Tube, Oscillatory, for applying High Doses to Deep-seated Lesions 202

Freezing-, Melting-, and Boiling-Points.
Transition Temperatures of Strontium Chloride and Bromide as Fixed Points. T. W. Richards and V. Yngve 313

Gases and Vapours, *see also* section Thermodynamics.
Argon, Density, Compressibility, and Atomic Mass of. A. Leduc ... 1172
Combustion of Explosive Gas Mixture within Closed Vessel. L. Flamm and H. Mache 690
„ , Preferential Catalytic, of Gases and Mixtures. W. D. Bancroft 1106
Equation of State, Influence of Finite Volume of Molecules on. M. N. Shaha and S. N. Basu 1173
Flame, Propagation of, through Tubes of Small Diameter. W. Payman and R. V. Wheeler 1171
„ , Propagation of, "Uniform Movement" during. W. Mason and R. V. Wheeler 176
Fog, Properties of. W. D. Bancroft 875
Helium, Determination of Density of. T. S. Taylor 309
Hydrogen, Liquid, Viscosity of. J. E. Verschaffelt 965
„ , Oxygen, and Nitrogen, Constitution of, and the Drude Dispersion Theory. A. Sommerfeld 520
Ignition of Gaseous Mixtures, Temperature of. J. W. McDavid 76
Methane-Air Mixtures, Inflammation of. R. V. Wheeler 1262
„ „ , Limits of Inflammability of. W. Mason and R. V. Wheeler 283
Nitrogen, Active, Recent Studies on. R. J. Strutt 803
Petrol, Entropy Diagram for. J. Rey 543
Thomson-Joule Effect for Air, Dependence of, on Pressure and Temperature. F. Noell 544
Vapour Pressure, *see* separate section.
Wien's Distribution Law, Criticism of. F. E. Wood 386

Gravity.
Attraction of Hollow Cylinder. A. Riggenbach 130
Einstein Gravitational Theory and Problem of Matter. G. Mie 232
Einstein's Gravitational Theory, Physical Basis of. F. Kottler 1213
Experiments on Gravitation. P. Zeeman 333
"*g*," Exact Values of, through United States. S. A. Moss 1143
Gravitation. V. Crémieu 131, 132
„ Constant and Fundamental Quantities of Electrical Theory, Relationship between. A. Haas 1020
„ Theories. L. Bloch 453
„ Theory, Einstein's. H. A. Lorentz 729
Gravitational Equations, General Covariant, Solution System of. E. Schrödinger 452
„ Field, Remarks on Schrödinger's Paper on Energy Components of. A. Einstein 728
„ Propagation, Velocity of. Observations upon Communication by P. Gerber. M. v. Laue 231

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Gravity, *continued.*
Gravitational Theory, Einstein's, Action of Rotating Distant Masses in. H. Thirring 449
Gravitation and Electricity. H. Weyl 908
„ , Relative Theory of, from Standpoint of Scalar Potential. J. Ishiwara 909
„ , Theory of. H. Weyl 605
Gravity. Guillet 450
Mass of Material System according to Gravitation Theory of Einstein. G. Nordström 822

Inductance (Self and Mutual).
Measurements, *see* separate section.
Self- and Mutual-Inductance, Formulæ for. F. W. Grover 1120

Interference.
Coloured Interference Bands and Colours of Tempered Steel. A. Mallock 1153
Diffracting Apertures, Foucault's Test and Radiation from Edges of. S. Banerji 1154
Diffraction at Metallic Screens. P. S. Epstein, R. Schachenmeier ... 59
„ by Systems of Small Apertures or Opaque Particles. W. J. de Haas 1155
„ from Circular Source. M. Hamy 635
„ of Images of Circular Objects. M. Hamy 518
„ of Light by Cylinders of Large Radius. N. Basu 363
„ „ „ Perfectly Reflecting Cylinder. T. K. Chinmayanandam 925
„ Phenomena, Diffraction Waves in Kirchhoff's Theory of. A. Rubinowicz 260
„ Problem, Sommerfeld's, New Solution and Extension of. R. Hargreaves 1248
„ , Oblique, Asymmetry of Illumination-curves in. S. K. Mitra 362
Fringes, Achromatic, Types of. C. Barus 832
Interference of Pencils which Constitute Remote Divergences from Slit. C. Barus 833
Interferometer, Fabry-Perot, Limit of Interference in. M. N. Saha 261
Interferometry of Small Angles. C. Barus 57, 262
Light, Constant Speed of, from Moving Mirror, Experimental Demonstration of. Q. Majorana 50, 927
Quartz and Sodium Chlorate, Interference Colours of, in Polarised Light. H. T. Liebisch and A. Wenzel 368
Scattering of Light. Rayleigh 664
„ „ by Air Molecules. R. W. Wood 1151
„ „ „ Dust-free Air. R. J. Strutt 835
„ „ „ Spherical Shells. Rayleigh 517
„ , Molecular, of Light. C. Fabry 519

Lenses and Optical Systems.
Eyepieces, Anastigmatic. A. E. Conrady 753
Focometry, Nodal Slide Method of. J. A. Tomkins 360
Glasses, Optical, Naming of. W. Zschokke 831
Lens, Light Distribution round Focus of, at Various Apertures. L. Silberstein 361
„ , Two-piece, Complete Achromatisation of. G. W. Moffitt 516
Lenses, Axial Aberrations of. E. D. Tillyer and H. I. Schultz 774
Measurements, *see* separate section.
Objective, Two-lens, Calculation of. K. Yamada 1083
Objectives, Multiple Thin, Class of. T. Smith 258
„ , Telescope, obtaining Constructional Data for. T. Smith 671
„ , Telescopic, Graphical Methods of Testing. A. O. Allen 754
„ , Triple Cemented Telescope. T. Smith and [Miss] A. B. Dale 257

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Lenses and Optical Systems, *continued.*
Optical System, Centred, Primary Monochromatic Aberrations of. S. D. Chalmers 672
„ System, Symmetrical, Method for Investigating Aberrations of. T. Chaundy 53
„ System, Tracing Rays through. T. Smith 926
Photography, *see* separate section.
Polarisation, *see* separate section.
Prism, Polarisation Theory of. H. Schulz 923
Prisms, Constant-deviation. H. S. Uhler 675
„ , *see also* sections Dispersion, Refraction, and Absorption (Light).
Reflection, *see* separate section.
Refraction, *see* separate section.

Magnetism.
Alloys, Pure, Preparation of, for Magnetic Purposes. T. D. Yensen 623B
Apparatus and Instruments, *see also* separate section.
A3 and A4 Transformations in Iron and Steels, Investigation of. T. Ishiwara 414
Basalt, Greenland, Magnetic State of. P. L. Mercanton 198
Bismuth, Electrical Properties of, in and out of Magnetic Field. G. Borelius and A. E. Lindh 107
Carbides in Steels, Magnetic Analysis of. T. Ishiwara 872
Carbon Steels, Magnetic Transformation of. G. Rümelin and R. Maire 1191
Cementite, Investigation of States of, in Annealed and Quenched Carbon Steels. K. Honda 413
Crystal, Iron, Energy of Magnetisation of. K. Beck 305
Electromagnetic Theory, *see* separate section.
Ferromagnetic Parameters, Relation among. G. Vallauri 200
„ Substances, Molecular Theory of. K. Honda and J. Ôkubo 411
Ferromagnetism, Property of. P. Weiss 1122
Flux Distribution, Magnetic, in Annular Steel Laminæ. A. E. Kennelly and P. L. Alger 118B
Hall-effect. M. La Rosa and U. De Luca 1278
„ , Reversal of, in Alloys. A. W. Smith 113
Hydrogen, Diamagnetism of, and Value of Magneton. A. E. Oxley 1277
Hysteresis Loss by Magnetisation, Theory of. K. Honda and J. Ôkubo 410
„ Losses for D.C. and A.C. Magnetisation. L. Dreyfus ... 622B
„ Magnetic, Analytical Representation of. F. Piola 199
„ „ , and van der Waals' Equation E[va] Bruins, J. R. Ashworth 109
„ Suppresion of, in Iron-Carbon Alloys. C. W. Waggoner and H. M. Freeman 409
Internal Moment of Momentum in Iron and Nickel. J. O. Stewart 412
Iron Powder, Magnetisation of. K. Honda 110
Kerr-effect in Ferromagnetic Compounds. P. Martin 990
Liquids, Magnetic Susceptibility of Mixtures of. A[lpheus] W. Smith and A[lva] W. Smith 1193
Magnetic Rotation, Optical, *see* section Polarisation.
Magnetisation of Iron in Absence of Hysteresis. W. R. Wright ... 564
Magneto-Magnets, Technics of. E. H. Crapper 850B
Magneton, Parson, Experimental Evidence for. L. O. Grondahl ... 108
Magnetostriction, Molecular Instability caused by. D. Hurmuzescu 1179
Manganese and Special Manganese Steels, Magnetic Properties of. R. Hadfield, C. Chéneveau, and C. Géneau 111
Measurements, *see* separate section.
Nickel Steels, Cause of Irreversibility of. K. Honda and H. Takagi 871
Normal State and Polarisation in Iron. E. Velander. 989

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Magnetism, *continued.*
Oxides, Rare Earth, Magnetic Properties of, as Function of Temperature. E. H. Williams ... 1102
Paramagnetism, Contribution to Quantum Theory of. F. Reiche ... 798
Particle, Ultimate Magnetic, Nature of. A. H. Compton and O. Rognley ... 566
Permeability, Reversible Magnetic, at High Frequencies. F. Erhardt ... 706
Resistance and Magnetisation. C. W. Heaps ... 112
Salts, Paramagnetic, Magneton and Solutions of. P. Weiss ... 304
Susceptibility, Magnetic, and Electric Resistivity. F. H. Loring ... 988
Tellurium, Change in Electrical Resistance of, in Transverse Magnetic Field. B. Beckman ... 565
Terrestrial Magnetism, *see* separate section.
Thermo-Magnetism, *see* section Thermo-Electricity.
Weiss Molecular Field in Ferromagnetic Substances. K. Honda ... 1123

Measurements and Use of Instruments.
Alternating Currents and Electric Oscillations, New Method of Measuring. I. Williams ... 1117
Analysis, Quantitative, New Process of. A. B. P. Leme ... 714
Balance, Limitations of. B. Blount ... 4
Braun Tube, Interpretation of Oscillograms obtained with. G. C. Trabacchi ... 986
Capacities, New Ballistic Method for comparing. P. Thomas ... 1189
Curves, Periodic, Analysis of. H. Weiss ... 884
Density Variations, Linear Dimensions of. L. S. Ornstein and F. Zernike ... 595
Ebullioscopic Determinations with Common Thermometer. C. C. Kiplinger ... 956
Elastics of Small Bodies, Measuring. C. Barus ... 218
E.M.F.'s, Measurements of. F. Wenner, P. D. Foote, and E. E. Weibel ... 559
Emulsions. W. P. Davey ... 575
Error, Law of. F. Y. Edgeworth ... 816
Errors in Sum of Number of Tabular Quantities. F. Schlesinger ... 147
„ , Instrumental Systematic, Determination of. K. Lüdemann 3
Eyepieces, Anastigmatic. A. E. Conrady ... 753
Flames, Coloured, of High Luminosity for Demonstration, Production of. G. A. Hemsalech ... 46
Focometry, Nodal Slide Method of. J. A. Tomkins ... 360
Force, Maximum, between two Coaxial Circular Currents, Calculation of. H. Nagaoka ... 705
Foucault's Test, Theory of. S. Banerji ... 1154
Gas Interferometer Calibration. J. D. Edwards ... 54
Glass-melting Furnaces, Temperature Control in. C. N. Fenner ... 574
Glass Tips, Grinding, for Drop-weight Apparatus. A. C. H. Davies ... 726
Gyro-stabiliser for Ships. N. Watanabe ... 1024
High-tension Direct-current from A. C. Supply. H. Greinacher ... 405B
Hydrometer Floats, Glass, Variability of. W. Block ... 1012
„ , New "Total-immersion" A. Angström and H. Pettersson ... 1
Hygrostat and its Management. R. Kempf ... 211
Ignition, Temperature of, of Gaseous Mixtures, J. W. McDavid ... 76
Impulsive Forces, Measurement of. L. Schlussel ... 594
Induction Coil, Using, with Inversion of Magnetisation in Primary. G. C. Trabacchi ... 977
Induction Coil with Interrupter of Recent Type, Action of. O. M. Corbino ... 976
Inertia, Moments of, of Form $X d\theta/dt$, Experimental Determination of. A. Guillet ... 891
Light, Visible and Invisible, Separation of. W. S. Andrews ... 47

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Measurements and Use of Instruments, *continued.*

Magnetisation, Measurement of, as Function of Temperature and Field. A. Piccard 303
Manometers, Various, Comparison of. L. Holborn..... 725
Micromanometers, Innovations with Respect to. M. Berlowitz 217
Millikan's Experiment, Use of Mercury Droplets in. J. B. Derieux... 454
Mirrors, Knife-edge Shadows for Testing. R. W. Porter 1081
Objectives, Multiple Thin, Class of. T. Smith 258
„ , Telescope, Approximate Methods in obtaining Constructional Data for. T. Smith 671
„ , Telescopic, Graphical Methods of Testing. A. O. Allen... 754
Optical Retardations, Small, Methods for Detecting. Rayleigh 673
„ Surfaces, Correction of. A. A. Michelson 1082
Photographic Densities, Table of Log_{10} Sec.^{2} for Determining, by Means of Nicol Prisms. P. S. Helmick 521
Prisms, Constant-deviation. H. S. Uhler 675
Pyrheliometer, Marvin, Characteristics of. P. D. Foote 1011
Rheostat Design. H. L. Dodge 796
Salinity, Sea-water, Electrical Instrument for Recording. E. E. Weibel and A. L. Thuras..... 593
Seismograms, Mechanical Evaluation of. W. Schmidt 627
Similitude and Homogeneity, Extension to Physics of Principles of. P. Straneo 1214
Spectral Intensities, Photographic Method of Determining. G. Holst and L. Hamburger 778
Spectroscopes, Talbot's Bands and Resolving Power of. T. E. Doubt 62
Standards, End, of Length, Determination of. C. E. Guillaume..... 1014
Stereoscope, Use of, for Viewing Contour Maps. H. Hubert 216
Temperature Determinations by Eutectic Alloys. C. P. Steinmetz... 280
Thermopile, Moll's, for Absolute Measurements. N. H. S. van Reesema 364
Thermostat, High-temperature, Further Notes on. J. L. Haughton and D. Hanson 686
Time-keeping and Clocks. R. A. Sampson 1208
Torsion Problems, Use of Soap-films in Solving. A. A. Griffith and G. I. Taylor 221
Unit of Absolute Pressure, Nomenclature of. C. F. Marvin..... 1144
Vacua, High, Production and Measurement of. J. E. Shrader and R. G. Sherwood 1023
Vibrations, Experimental Study of. A. Poucholle 443
„ , Forced, Experimentally Illustrated. E. H. Barton and H. M. Browning 1140
Voltameter, Silver, Anode Complications in. J. Obata 563
Wave-length Measurements in Spectra from 5600 to 9600 A.U. W. F. Meggers 777
„ -length Standards, Iron Arc free from Pole-effect for. C. E. St. John and H. D. Babcock 64
Weston Normal Cell. J. Obata..... 1118

Metallography and Properties of Metals.

Alloys, *see also* separate section.
Aluminium-Zinc Alloys. O. Bauer and O. Vogel..... 118
„ , Metallography of. R. J. Anderson 1133
Brass, Alpha and Beta, Thermal Expansion of. P. D. Merica and L. W. Schad 774B
Brasses, Experiments on Fatigue of. B. P. Haigh 581
Brinell Ball-hardness Test. Guillery 219
„ Hardness, Maximum Stress, and Elongation, Relationship of Impact Value to. G. Berndt..... 888
Cadmium, Allotropy of. E. Cohen 1000
„ , Study of Allotropy of. F. H. Getman 206
Cast Iron, Grey, Heat Treatment of. J. E. Hurst 427

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Metallography and Properties of Metals, *continued.*

Cementation of Iron. S. A. Fechtchenko-Tchopovsky 120
Cementite Transformation and Equilibrium Diagram of Iron-Carbon System by Means of Resistance Measurement. I. Iitaka 1281
„ , Forms in which it appears in Hypereutectic Steel, according to Heat Treatment. N. G. Ilyine 126
„ , Structurally Free, Formation of, in Soft Steel. A. L. Babochine 122
Compound Stresses, Fluctuating, Failure of Ductile Materials under. H. A. Webb and W. H. Barling 889
Corrosion of Metals by Acids. O. P. Watts and N. D. Whipple..... 1009
Etching Agent, Use of Chromic Acid and Hydrogen Peroxide as. S. W. Miller 589
Grain-size Measurements. Z. Jeffries 584
Graphite, Formation of, in Iron-Carbon Alloys. J. E. Hurst 1204
Guns, Erosion of. H. M. Howe 429
Hardness of Metals, Determination of, by Impact. C. A. Edwards and F. W. Willis 886
„ , Definition of. W. C. Unwin and F. Buckingham..... 817
„ , „ „ . R. M. Leslie 1015
Heat Treatment, Effect of Mass on. E. F. Law 1129
Indentation, Elastic, of Steel Balls under Pressure. C. A. Briggs, W. C. Chapin, and H. G. Heil..... 887
Iron at High Temperatures, Criterion for Allotropic Changes of. K. Honda 585
„ , Carbon, and Phosphorus. J. E. Stead 1128
„ , Causes of Streaky Structure of. P. Oberhoffer and P. Hartmann 123
„ , Commercially Pure, Microstructure of, between Ar 3 and Ar 2. W. J. Brooks and F. F. Hunting..... 425
„ , Further Observations on Streaky Structure of. P. Oberhoffer and H. Meyer 124
Load Extension Optical Indicator, Auto-graphic, Researches made possible by. W. E. Dalby..... 447
Martensite, Troostite, Sorbite. P. Dejean 121
Mixed Crystal Alloys, Thermoelectric Properties as Method of Analysis for. G. Borelius 430
Muntz Metal, Typical Cases of Deterioration of, by Selective Corrosion. H. S. Rawdon 804
Nickel Steels, Cause of Irreversibility of. K. Honda and H. Takagi 871
Pearlite, Effect of Cold-work on Divorce of. J. H. Whiteley 1127
Platinum Ware, Substitutes for. R. F. Heath 310
Pure Metals, Preparation of.. F. Mylius 423
Quenched Metals, Cooling Curves of. Garvin and P. Portevin 119
Quenching, Variations in Volume of Metals during. M. Oknoff 125
Shock Tests, New Experiments on, and on Determination of Resilience. G. Charpy and A. Cornu-Thenard..... 129
Steel, Acid Open-hearth, Investigation upon cost of. T. D. Morgan and F. Rogers 426
„ , Effects of Cold Work on Elastic Properties of. J. A. van den Broek 1282
„ , Grain Growth in. H. M. Howe 1003
„ , Heterogeneity of. H. le Chatelier and E. L. Dupuy 711
„ , „ „ . G. Charpy and S. Bonnerot..... 712
„ , „ „ . H. le Chatelier and B. Bogitch 1280
„ , High-speed, Researches on carried out at Harvard Laboratory. Yatsevitch 805
„ , Hypereutectoid, Transformation of Martensite in. M. Matweieff 582
„ , Inclusions in, and Ferrite Lines. J. E. Stead 999
„ , Influence of Forging upon Mechanical Properties of. G. Charpy..... 1001

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Metallography and Properties of Metals, *continued.*
Steel, Influence of Heat Treatment on Electrical Properties of. E. D. Campbell and W. C. Dowd 197
„ , Iron and Carbon, Grain-size Inheritance in. Z. Jeffries 208
„ , Macrostructure of. A. Portevin and V. Benard 878
„ , Medium Carbon, Effect of Presence of Small Amount of Copper in. C. R. Hayward and A. B. Johnston 424
„ , Mild, Strength and Inner Structure of. W. E. Dalby 207
„ , Non-metallic Inclusions, their Constitution and Occurrence in. A. McCance 1132
„ , Quenched and Cold-worked Carbon. F. Cloup 588
„ , Recently Hardened, Spontaneous Generation of Heat in. C. F. Brush 586
„ , Tempered, Coloured Interference Bands and Colours of. A. Mallock 1153
„ , Tempering, Time Effect in. A. E. Bellis 428
„ , Thermal Treatment of, Neglected Points with regard to. M. E. Leeds 314
Steels and Pure Iron, Magnetic Investigation of A3 and A4 Transformations in. T. Ishiwara 414
„ , Annealed and Quenched Carbon, Magnetic Investigation of States of Cementite in. K. Honda 413
„ , Carbon, Anomalous Elasticity of, and Reversible Transformation of Cementite. P. Chevenard 587
„ , Carbon, Magnetic Transformation of. G. Rümelin and R. Maire 1191
„ , Carbon, Rates of Cooling for Tempering. P. Chevenard 877
„ , „ , Thermal Dilatation and Rate of Solution of. J. Driesen 316
„ , Chromium and Copper, Hardening of. L. Grenet 710
„ , Hardened Carbon, Slow Contraction of. T. Matsushita 1004
„ , Heterogeneity of. H. le Chatelier and E. L. Dupuy 317
„ , „ . G. Charpy and S. Bonnerot 315
„ , Magnetic Analysis of Carbides in. T. Ishiwara 872
„ , Nickel-Chrome, Transformation and Microstructure of. A. N. Masloff 583
„ , Nickel, Thermal and Electrical Conductivities of. K. Honda 1190
„ , Thermoelectric Potential of Solutes in, and Influence of Temperature on Resistivity. E. D. Campbell 1119
„ , Tungsten, Structure of, and its Change under Heat Treatment. K. Honda and T. Murakami 876
Struts, Short Tubular, of High-tensile Steel, Failure of. W. C. Popplewell and H. Carrington 818
Titanium, Metallurgy of. R. J. Anderson 713
Tungsten, Metallography of. Z. Jeffries 1062
„ , Variation of Elasticity of, with Temperature. H. L. Dodge 727

Meteorology.
Anemometer Records on Office Building compared with those near Lake Surface. B. C. Kadel 336
Atmosphere, General Movements of. P. Garrigou-Lagrange 1222
„ , Lower, Phenomena connected with Turbulence in. G. I. Taylor 237
„ , Lower, Ultra-violet Transparency of. R. J. Strutt 466
„ , Propagation of Heat in Lower Layers of. H. Perrotin 827
„ , Revolving Fluid in. N. Shaw 8
„ , „ „ . J. Aitken 461
Atmospheric Absorption and Terrestrial Temperature. C. G. Abbot 730
„ Circulation above Australasia according to Pilot Balloon Observations. W. van Bemmelen 1028
„ Pressure, Periodicity of, in Alps in Winter. J. Maurer 737
„ Refraction, Coefficient of, based on Meteorological Elements. V. Reina 738

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Meteorology, *continued.*

"Carnegie." Meteorological Observations on, during Sub-Antarctic Cruise. J. P. Ault 230
Cloud Formations as Observed from Aeroplanes. C. K. M. Douglas 464
Clouds, Scarf. C. F. Brooks 1029
Convection Currents, Periodic, in Atmosphere. H. Jeffreys 7
Cooling of Air near Ground at Night. G. Hellmann 1221
Daylight Illumination Intensities and City Smoke. H. H. Kimball and A. H. Thiessen 342
Dip-of-Horizon Measurements on "Galilee" and "Carnegie," 1907–1917. W. J. Peters 914
Evaporation from Circular Water Surface. N. Thomas and A. Ferguson 71
" from Snow Surfaces, Field Experiments on. F. S. Baker 1032
Free Air Data at Drexel, January to June, 1917. W. R. Gregg 1218
Hailstorm, Nebraska, of August 8, 1917. G. A. Loveland 463
Halo, Solar, of Feb. 4, 1918. J. P. Henderson and A. F. Hunter 625
Haloes at Columbus, Ohio. H. H. Martin and J. L. Vesper 1025
" , Further Study of, in Relation to Weather. H. H. Martin ... 1034
" , Solar, Distorted. A. F. Hunter 340
Hoar Frost, Influence of Radius of Curvature of Body on Formation of. G. Reboul 1219
Humidity, Relative. A. N. Shaw 741
Hurricanes, West Indian, as Observed in Jamaica. M. Hall 616
Meteorographical Office, European, Suggestion for. R. de Saussure 820
Mild Winters. G. Hellmann 739
Minimum Temperatures, Predicting. J. W. Smith 1033
Nocturnal Cooling of Lower Layers of Atmosphere. H. Perrotin ... 740
" Radiation Measurements. H. H. Kimball 1031
Pressure Variations, Accidental, in United States. A. J. Henry 338
" , Simultaneous Variations of, and Solar Activity, Relation between. S. Hanzlik 743
Pyrheliometer, Marvin, Characteristics of. P. D. Foote 1011
Raindrops, Negatively Electrified, Formation of. F. Sanford 1183
Rainfall, Mean Annual, of United States. R. De C. Ward 1030
Rain, Wind, and Cyclones. R. M. Deeley 460
Records at Abbe Observatory compared with those at Cincinnati. W. C. Devereaux 337
Seasonal Correlation, Far Eastern, Researches in. T. Okada ... 339, 462
Sky, Apparent Form of Dome of. H. Dember and M. Urbe 1147
Snowfall of New England. C. F. Brooks 344
Solar Atmosphere, Absorption and Radiation of. S. Hirayama 632
" Constant. E. Schwoerer 735
" Coronæ: Five Years' Recent Observations. J. Maurer 626
" Disturbances and Terrestrial Weather. E. Huntington 1220
" Radiation and Terrestrial Meteorology. H. H. Clayton 6
Temperature Correlations in United States. T. A. Blair 622
" Distribution in a Pond. T. Terada 465
Temperatures, Winter, Periodicity of, in Western Europe. C. Easton 913
Tornado, Photographs of. H. E. Simpson 341
Tornadoes and Windstorms of May 25–June 6, 1917. H. C. Frankenfield 343
Twilight Phenomena. P. Gruner 742
War-flying and Meteorology. R. De C. Ward 915
Warmth of Dawn. O. Meissner 1223
Water-level and Barometric Pressure, Relation between, in Well. E. G. Bilham 235
Waterspouts, Two, Observed at Rabat on December 18 1917. J. Peyriguey 744
Whirlwind at Pasadena, Cal. F. A. Carpenter 1036
Wind, Diurnal Variation of, with Height. L. Dunoyer, C. E. Brazier 620

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Meteorology, *continued.*
Wind, Diurnal Variation of, with Height. Reboul 621
„ „ „ „ „ „ L. Dunoyer and G. Reboul 234
Winds, Turning of, with Altitude. W. R. Gregg 623
Winters, Severe. G. Hellmann 624
Miscellaneous (Chemical Physics and Electro-Chemistry).
Absorption, *see* separate section.
Ammonia, Synthesis of, at High Temperatures. E. B. Maxted 715
Analysis, Quantitative, New Process of. A. B. P. Leme 714
Atomic Weights, *see* section Molecular Physics.
Brownian Movements, *see* section Molecular Physics.
Catalysis, Contact. W. D. Bancroft 127, 590, 591, 809
Cohesion. IV. H. Chatley 899
Colloidal Gold and Platinum, Precipitation of, on Metallic Surfaces. E. B. Spear and K. D. Kahn 319
Colour of Inorganic Compounds. F. R. v. Bichowsky 812
Conductivity, *see* section Conductivity and Resistivity.
Corona, Chemical Reactions in. I. Ozone Formation. F. O. Anderegg..... 205
Crystals (except Liquid and Mixed Crystals), *see* section Molecular Physics.
„ , Liquid. II. Influence of Temperature on Extinction. W. J. H. Moll and L. S. Ornstein 312
„ , Liquid, Studies in. T. C. Chaudhari 1199
Diffusion, *see* separate section.
Dissociation and Ionisation, *see* separate section.
Electric Furnace Processes, *see* separate section.
Electrodes, Normal, *see* section Batteries, Primary.
Electrolysis, *see* separate section.
Electrolytic Analysis, *see* separate section.
Emulsions. W. P. Davey 575
Equilibrium, Chemical, *see* section Chemical Equilibrium.
Films, very Thin Metal, Ultramicroscopic Investigation of. W. Reinders and L. Hamburger..... 895
Fog, Properties of. W. D. Bancroft 875
Gases ; for Gaseous Laws, *see* separate section.
Gas Structure, Theory of. W. A. Osborne 1203
Glass, Annealing of. S. English and W. E. S. Turner 422
Glassware, American Chemical, Comparative Tests of. P. H. Walker and F. W. Smither 1201
Gold, Chemistry of, at High Temperatures and Pressures. H. H. Morris 998
Ionisation, *see* section Dissociation.
Lead, Spectroscopic Estimation of, in Copper. C. W. Hill and G. P. Luckey 1126
Liquid and Solid Volume Curves, Convergence of, to Absolute Zero. G. Le Bas 421
Molecular Attraction, *see also* section Molecular Physics.
„ „ , XV. Specific Heats of Elements and some Energy Changes. J. E. Mills 311
„ Frequency and Molecular Number. H. S. Allen 458
Nitric Oxide, Velocity of Oxidation of, in Reference to Industrial Problem of Oxidation of Oxides of Nitrogen. E. Briner ... 1005
Optical Activity and Rotation, *see* section Polarisation.
Osmosis, *see* separate section.
Oxidation and Combination of Gases by Electric Discharge, *see also* section Discharge.
Ozonisation, Photochemical ; Influence of Wave-length and Pressure. E. Warburg 879
Phase Rule, *see* sections Chemical Equilibrium and Thermo-dynamics.
Quantities b and $\sqrt{a}$ for different Elements, Values of, in Connection with Periodic System. J. J. van Laar 810

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Miscellaneous (Chemical Physics and Electro-Chemistry), *continued.*
Rate of Chemical Reaction, System of Recording. J. W. McBain ... 431
Slimy-crystalline Liquids, Hydrodynamics of. O. Lehmann 1200
Solution and Solubility, *see* separate section.
Sulphuric Acid and Oleum, Thermal Properties of. A. W. Porter 1131
Sulphur Molecule, Third Kind of. V. A. H. W. Aten 874
Thermochemistry of Organic Compounds, Standard Unit in. W. Swientoslawski 432
Thermo-Chemistry, *see also* section Miscellaneous (Heat).
Thermodynamic Investigations, *see* section Thermodynamics.
Ultra-violet Light, Rôle of, in Chemical Reaction. D. Berthelot ... 435
Vapours; for Gaseous Laws, *see* section Gases.
Viscosity, *see* separate section, *also* section Solution.

Miscellaneous (Electricity and Magnetism).
Alternate-Current Research, *see* separate section.
Arc, Electric, *see* section Discharge.
Atmospheric Electricity, *see* section Static Electricity.
Capacity (Electrostatic), *see* separate section.
Cells, Voltaic, *see* section Batteries, Primary.
Condensers, *see also* sections Capacity, Dielectrics, and Discharge.
Conductivity (Electric) and Resistivity, *see* separate section.
Contact Electricity, *see* section Batteries, Primary.
Crookes Tubes, *see* section Discharge.
Dielectrics, *see* separate section.
Discharge (Electric), *see* separate section.
„ Rays, *see* section Rays.
Earth Currents, *see* section Terrestrial Magnetism and Electricity.
Electrification, *see* section Static Electricity.
Electromagnetic Theory, *see* separate section.
Electrostatics, *see* section Static Electricity.
Field, Magnetic, *see* section Magnetism.
Galvanometers, *see* sections Apparatus and Measurements.
Hall-effect, *see* section Magnetism.
Hysteresis, *see* section Magnetism.
Induction, Electromagnetic, and Relative Motion. II. S. J. Barnett 547
Induction, Magnetic, *see* section Magnetism.
„ (Self and Mutual), *see* separate section.
Interrupters, *see also* section Apparatus (Electrical).
Kathode Rays, *see* section Rays.
Lightning, *see* section Static and Atmospheric Electricity.
Magnetism, *see* separate section.
Measurements, *see* separate section.
Permeability, *see* section Magnetism.
Photoelectric Cells, *see* section Batteries, Primary.
Polarisation (Electrolytic), *see* separate section.
Röntgen Rays, *see* section Rays.
Specific Inductive Capacity, *see* section Dielectrics.
Static Electricity, *see* separate section.
Telegraphy, *see* Section B.
Telephony, *see* Section B.
Terrestrial Magnetism and Electricity, *see* separate section.
Thermo-Electricity and Thermo-Magnetism, *see* separate section.
Tubes, Vacuum, *see* sections Discharge and Apparatus.
Vibration of Wire forming Part of Closed Circuit, Experiments on Effect of. H. Jackson 1276
Voltaic Action, *see* section Batteries, Primary.
Voltameters, *see* section Electrolysis.
Waves, *see* section Oscillations and Waves.
Wireless Telegraphy, *see* Section B, *also* section Oscillations.
X-Rays, *see* section Rays.

For the **Explanation** of this Index see p. 535.

Abstract Nos

Miscellaneous (General Physics).
Aerodynamics, *see* section Dynamics.
Alloys, *see* separate section.
Astronomy, *see* separate section.
Atomic Weights, *see* section Molecular Physics, Matter, and Ether.
Brownian Motions, *see* section Molecular Physics.
Capillarity, *see* section Surface Tension.
Clock Rates, Erratic Changes in. W. A. Conrad..... 2
Critical Constants, *see* section Critical Points.
Deformation, *see* section Elasticity.
Diffusion, *see* separate section.
Dynamics, *see* separate section.
Earth Pressures. P. M. Crosthwaite 828
Elasticity, *see* separate section.
Errors in Sum of Number of Tabular Quantities. F. Schlesinger ... 147
Ether, *see* section Molecular Physics, Matter, and Ether.
Expansion, *see* section Dilatation.
Gravity, *see* separate section.
Knowledge, Scientific, Production of. C. E. K. Mees..... 233
Laboratory, National Industrial Research. R. T. Glazebrook 411B
Lagrange Equations, Generalised, for Non-holonomous Co-ordinates, Simple Deduction of. C. Schaefer 616
Lubricating and other Properties of Thin Oily Films. Rayleigh..... 330
Lubrication, Theory of. Rayleigh 329
Measurements, *see* separate section.
Mechanical Problems, *see* section Dynamics.
Metallography, *see* separate section.
Meteorology, etc., *see* separate section.
Pressures (High and Low), *see* separate section.
Progress, Century's, in Physics. L. Page 903
Rigidity, *see* section Elasticity.
Steam, Efflux, Velocity and Specific Heat of, *see* sections Gases and Specific Heat, *also* Section B.
Stress, *see* sections Elasticity and Metallography.
Surface Tension, *see* separate section.
Torsion, *see* section Elasticity.
Viscosity, *see* separate section.

Miscellaneous (Light).
Absorption, *see* separate section.
Analogy between Optical Problem concerning Moving Media and Aeronautical Exercise. P. Frank..... 332
Canal Rays, *see* section Rays.
Carborundum, Physical Properties of. O. Weigel 58
Colour of Pigments and Paints, Optical Properties and Theory of. H. E. Merwin..... 834
Crookes Tubes, *see* Tubes (section Discharge).
Daylight, Artificial, Production of. I. G. Priest 1246
Diffraction, *see* section Interference.
Dispersion, *see* separate section.
Electromagnetic Waves, *see* section Oscillations and Waves.
Envelope of Spherical Rays emitted by Moving Body. M. Aubert ... 264
Ether, Relative Motion of, *see also* sections Molecular Physics, Dynamics, and Interference.
Fluorescence, *see* section Phosphorescence.
Huyghens, Formulation of Principle of. A. Anderson 1152
Index of Reflection, *see* section Reflection.
„ of Refraction, *see* section Refraction.
Interference, *see* separate section.
Kathode Rays, *see* section Rays.
Lenses and Optical Systems, *see* separate section.
Light-pressure. O. Klotz 1247
Mechanical Equivalent of Light and Brightness of Black Body. G. Holst and J. S. de Visser 837

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Miscellaneous (Light), *continued.*
Mirage on Queensferry Road. A. G. Ramage 1242
Motions of Illuminated Particles (*Die Photophorese*). F. Ehrenhaft... 1085
Photo-chemical Reactions, *see* section Miscellaneous (Chemical Physics).
Photometry, *see* separate section.
Rays, *see* separate section.
Rockets and Illuminating Shells as used in Present War. A. Bergman..... 930
Röntgen Rays, *see* section Rays.
Rotatory Polarisation, *see* section Polarisation.
Scattering of Light by Dust-free Air. R. J. Strutt 835
„ Media, Behaviour of, in diffused Light. H. J. Channon, F. F. Renwick, and B. V. Storr..... 665
Speed of Light, Constant, Experimental Demonstration of, from Moving Mirror. Q. Majorana.....50, 927, 1087
„ of Optical Signal in Absorptive Medium. A. Schidlof 1084
Transparency, *see* section Absorption.
X-rays, *see* section Rays.

Miscellaneous (Heat).
Boiling-Points, *see* section Freezing-Points.
Combustion, Preferential Catalytic, of Gases of Mixtures. W. D. Bancroft 1106
Conductivity (Thermal), *see* separate section.
Evaporation from Circular Water Surface. N. Thomas and A. Ferguson..... 71
„ , Problems of. H. Jeffreys 691
Expansion, *see* section Dilatation.
Explosions, *see also* section Gases.
Flame, Propagation of, through Tubes of small Diameter. W. Payman and R. V. Wheeler 1171
Freezing-, Melting-, and Boiling-Points, *see* separate section.
Gases and Vapours, *see* separate section.
Heat-convection in Air, and Newton's Law of Cooling. W. P. White 281
„ of Vaporisation of Water, Redetermination of. J. H. Mathews 77
„ , Nature of, as directly deducible from Postulate of Carnot. J. Larmor 695
Latent Heat, *see* section Specific Heat.
Measurements, *see* separate section.
Mechanical Equivalent of Heat. T. C. Sutton..... 384
Melting-Points, *see* section Freezing-Points.
Pyrometry, *see* section Thermometry.
Specific Heat, *see* separate section.
Temperature, *see* separate section.
Temperatures (High and Low), *see* separate section.
Thermodynamics, *see* separate section.
Vapour Pressure, *see* separate section.

Molecular Physics, Matter and Ether.
Atom, Astronomical, and Spectral Series of Hydrogen. F. Sanford 1250
„ , First and Second Electronic Rings of. J. Kroo 1110
„ , Lithium. A. Hartmann..... 612
„ , Vibration of Electrons in, Spectra of Isotopes and. W. D. Harkins and L. Aronberg..... 271
Atomic Heats of Tungsten and Carbon at Incandescence. A. G. Worthing 850
„ Hypothesis, Bohr's. G. A. Schott..... 1216
„ Number, and Characteristic Frequency. H. S. Allen 226
„ „ „ Electronic Frequency. H. S. Allen 228
„ „ „ „ „ . P. D. Foote 1141
„ „ -frequency Formulæ with Empirical Constants, Atomic Frequency and. H. S. Allen 227
„ Stability, Problems of. J. W. Nicholson..... 611

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Molecular Physics, Matter and Ether, *continued.*

Atomic Structure of Tungsten. P. Debye 169
„ „ , Problems in. J. J. Thomson 904
„ Weights, Densities and Thermal Properties of Chemical Elements, Connection between. K. Fehrle 1142
„ Weights, Variable. H. S. Shelton 117
Atoms, Radius of Electron and Nuclear Structure of. J. W. Nicholson 292
Attraction, Alleged Gravitational, between Revolving Electrons. A. C. Crehore 1215
Brownian Movement of Single Particles. R. Fürth 230
„ „ , Theory of. P. Ehrenfest 614
„ „ , „ , and Experiments of Brillouin. H. C. Burger 459
„ Movements. W. D. Bancroft 609
Calcite, Grating Space of, and X-ray Spectrum of Gallium. A. H. Compton, H. S. Uhler 1098
Cohesion. IV. H. Chatley 899
Colour of Inorganic Compounds. F. R. v. Bichowsky 812
Crystal Lattice, Stable. R. Schachenmeier 142, 533
„ Optics of X-rays. III. Foundations of Optics of Crystals. P. P. Ewald 950
„ Structure. A. C. Crehore 229
„ „ of Aluminium. P. Scherrer 381
„ „ of Alums and Rôle of Water of Crystallisation. L. Vegard and H. Schjelderup 681
„ Structure of Chalcopyrite, X-ray Examination of. C. L. Burdick and J. H. Ellis 168
„ Structure of Complex Compounds, Determination of. P. Niggli 949
„ Structure, Analysis of, by X-rays. C. Runge 70
Density of Helium, Determination of, by Means of Quartz Microbalance. T. S. Taylor 309
„ Variations, Linear Dimensions of. L. S. Ornstein and F. Zernike 595
Electrons, *see* section Electromagnetic Theory.
Ether Hypothesis. G. Helm 143
Films, very Thin Metal, Ultramicroscopic Investigation of. W. Reinders and L. Hamburger 895
Ice, Crystal Structure of. A. St. John 1027
Kinetic Theory of Gases, *see also* section Gases.
Matter, Astronomical Consequences of Electrical Theory of. O. J. Lodge 135
Molecular Attraction. XV. Specific Heats of Elements and Energy Changes. II. J. E. Mills 311
„ Frequency and Molecular Number. H. S. Allen 458
„ Frequency and Molecular Number. II. Frequency of Longer Residual Rays. H. S. Allen 615
„ Frequency and Molecular Number. III. Inorganic Compounds. Lindemann's Formula. H. S. Allen 730
Ore Flotation, Molecular Physics of. W. H. Coghill and C. O. Anderson 708
Periodic System of Elements. C. P. Steinmetz 801
„ „ „ P. V. Wells 802
„ „ „ S. Meyer 1134
„ „ , New Table of. I. W. D. Hackh 1197
Quantities b and $\sqrt{a}$ for different Elements, Fundamental Values of, in connection with Periodic System. J. J. van Laar 810
Solids, Non-molecular Structure of. A. H. Compton 892
Step Structure in Certain Anisotropic Liquids. F. Grandjean 709
Submicroscopic Particles, Size of. G. Laski 1209
Ultramicroscopic Particles, Size of. G. Laski 141

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Oscillations and Waves (Electric), *see also* sections Rays and Discharge, and section Telegraphy (Wireless) in Section B.
Amplifier, Thermionic, Theory of. H. J. van der Bijl 1267
Antenna, Bent, Approximation to Electric Field of. W. Nakayama 1114
Condenser Transmitter, Calibration of; Air-damped Vibrating System. J. B. Crandall..... 1121
Coupled Circuits, Action of, and Mechanical Analogies. H. C. Plummer..... 138
Diffraction of Electromagnetic Waves, Experimental Investigations on. M. Sjöström 99
„ of Plane Electromagnetic Wave by Conducting Sphere. J. Proudman, A. T. Doodson, and G. Kennedy 195
Electric Waves. W. S. Franklin and B. McNutt..... 697
Electrodes, Gas-free, Langmuir's Method of Constructing, for Vacuum Tubes 883B
Electron-discharge Apparatus, Preparation of Kathode for 681B
Excitation of Oscillatory Circuits. H. Wiesinger 980
Helices, Horizontal, Wave Velocity and Capacity of. A. Press, P. R. Coursey 795
Heterodyne Method of Reception, Amplification Obtainable by. G. W. O. Howe 885B
Lecker System, Harmonics of: Experimental. F. C. Blake and B. H. Jackson 1270
Quenched Spark. V. Pieck 554
Refraction of Water for Electric Waves. E. Rückert 978
Stability of Oscillations in Particular Oscillating Circuit. J. Bethenod 979
Thin Anchor Ring, Lommel-Weber Ω Function and its Application to Problem of Electric Waves on. J. R. Airey..... 696
Vacuum Tube, Three-electrode, Longmuir's Method for preparing... 882B
Wireless Telegraphy, *see* Section B.

Osmosis.
Osmotic Pressure. O. J. Lodge, A. W. Porter, F. Tinker, W. R. Bousfield..... 318
„ Pressure, Kinetic Theory of, and Raoult Law. II. G. Jäger 808
„ Pressure, Manifestation of, with Membranes of Inert Materials. S. L. Bigelow and C. S. Robinson 806, 807

Phosphorescence and Fluorescence.
Fluorescence of Certain Uranyl Salts. [Miss] F. G. Wick 527
„ of Four Double Nitrates. H. L. Howes and D. T. Wilber..... 67
„ , Thermodynamics of. E. H. Kennard 377
„ , Unpolarised, and Absorption of Uranyl Double Chlorides. E. L. Nichols and H. L. Howes 779
„ , Wave-length of Light which Excites, in Nitrogen. C. F. Meyer 162
Kathodo-fluorescence of Crystals. T. B. Brown 379
Luminescence of Uranyl Salts under Kathode-ray Excitation. [Miss] F. G. Wick and [Miss] L. S. McDowell 1095
„ , Faint, Colour Determination of. H. B. Weiser 846

Photography.
Artificial Light in Photography. H. Lux 931
Blackening of Photographic Plate, Variation in, with Time of Exposure. P. S. Helmick 836
Coloured Lines on Photographic Films. L. Dufay..... 153
Densities, Photographic, Table of Log_{10} Sec.^{2} for determining, by Means of Nicol Prisms. P. S. Helmick 521
Deposits, Photographic, Spectral Selectivity of. L. A. Jones and R. B. Wilsey..... 365
Images on Silvered Photo-plate. C. W. Waggoner 512
Lenses and Objectives, *see* separate section.

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Photography, *continued.*
Plate, Photographic, Physical Characteristics of Grains of. M. B. Hodgson 51
Prints, Photographic, Covering Power of Pigments in. F. F. Renwick 932
Red-sensitiser, Methyl-violet as, of Photographic Plate. U. Yoshida 933
Resolving Power, Photographic. K. Huse 367
Sensitometry of Photographic Intensification. A. H. Nietz and K. Huse 366
„ of Röntgenographic Materials. M. B. Hodgson..... 773
Stellar Images, Photographic, Influence of Development on. F. E. Ross 52

Photometry.
Black Body, Brightness of, and Mechanical Equivalent of Light. G. Holst and J. S. de Visser..... 837
„ Body, Candle Power of, and Radiation Constants of Carbon Filaments. H. Kohn 358
Industrial and Technical Photometry, *see* Section B.
Integrating Hemisphere. F. A. Benford, Jr. 878B
Minimum Radiation Visually Perceptible. P. Reeves 49
Pentane Lamp, Humidity Correction Factor for. K. Takatsu and M. Tanaka 259
Photometer, New Stellar. M. Maggini 662
Radiation Efficiencies of Light Sources. F. Conrad 679
Rockets and Illuminating Shells as used in Present War. A. Bergman 930

Polarisation (Electrolytic).
Overvoltage, *see also* section Electrolysis.
Passivity of Chromium. A. H. W. Aten 814, 882
Passivity, *see also* section Electrolysis.

Polarisation (Light, including Magnetic Rotation).
Anisotropic Liquids, Investigations of. Y. Björnståhl 924
Crystals possessing Optical Activity. T. Liebisch 1249
Faraday-effect in Non-ferromagnetic Metals. B. Pogány 56
Interference Colours of Quartz and Sodium Chlorate in Polarised Light. II. T. Liebisch and A. Wenzel 368
Isotropic and Anisotropic Liquids, Electronic Theory of Optical Activity of. M. Born..... 934
„ Liquids, Natural Optical Activity of. A. Landé. 1089
Magnetic Rotation of Plane of Polarisation in Gas composed of Bohr Molecules. F. Pauer 1090
Polarimetry 1088
Prism, Polarisation, Theory of. H. Schulz 923

Pressures, High and Low.
Great Hydrostatic Pressure, Effect of, on Physical Properties of Metals. Z. Jeffries 446
High Pressures, Discharge of Gases under. L. Hartshorn 223

Radio-activity.
Actinium Emanation, Diffusion of, and Range of Recoil from it. L. W. McKeehan 172
„ , Parent of. F. Soddy and J. A. Cranston 847
„ , „ . New Radio-active Element of Long Life. O. Hahn and L. Meitner..... 951
Atmosphere, Ionisation of, *see also* section Static Electricity.
α-Rays, Properties of Metals under Influence of. A. G. McGougan 1102
„ , Range of, on Sensitive Layer of Photographic Plates. E. Mühlestein..... 1100
β-Rays, Magnetic Deflection of. [Miss] N. C. B. Allen..... 1105
„ , Theory of Kaufmann and Bucherer's Investigations on. R. Malmström 684
γ-Rays of Radium, Absorption of. I. K. W. F. Kohlrausch 780
„ , Hard, from Radium, Wave-lengths of. K. W. F. Kohlrausch 1259

For the **Explanation** of this Index see p. 535.

Radio-activity. *continued.* Abstract Nos.

Gases, Radio-active, Distribution of, in Open Air. V. F. Hess and W. Schmidt 683
Ionisation, *see also* sections Dissociation and Discharge.
Isotopes of Lead, Spectrum of. L. Aronberg 678
Lake Rockanje, Radio-activity of. [Miss] H. J. Folmer and A. H. Blaauw 685
Lead, Isotopic. F. W. Clarke 1101
Nomenclature of Radio-elements. S. Meyer and E. v. Schweidler ... 383
Penetrating Radiation in Atmosphere, *see* section Rays.
Radiothorium, Mesothorium, and Thorium, Life of. L. Meitner ... 952
Radium. R. B. Moore... 1168
„ in Warfare. C. H. Viol and G. D. Kammer 1099
„ Sulphate, Solubility of. S. C. Lind, J. E. Underwood, and C. F. Whittemore..... 534
„ , Distribution of Active Deposit of, in Electric Field. S. Ratner..... 171
„ , Extraction of, from American Pitchblende Ores. [Mrs.] R. Cable and H. Schlundt..... 1104
Rocks, Archæan, from Mysore, Radio-activity of. W. F. Smeeth and H. E. Watson 275
Sea-salt, Radium Content of. C. W. Hewlett..... 273
Springs, Canadian Mineral, Radio-activity of. J. Satterley and R. T. Elworthy 1169
Thorium, Radio-active, Disintegration Constant of. B. Walter 173
Waters, Mineral and Thermal, Radio-activity of. H. Perret and A. Jaquerod 953
„ , Philippine, Radio-activity of. J. R. Wright and G. W. Heise 170

Rays and Radiation.

Black Body, Candle-power of, and Radiation Constants of Carbon Filaments. H. Kohn 358
Canal-rays, Hydrogen, Continuous Spectrum of. J. Stark, M. Görcke, and M. Arndt..... 532
„ , New Secondary Radiation from. M. Wolfke..... 68
Carbon, Optical Constants and Radiation Laws of. H. Senftleben and [Miss] E. Benedict 513
Crystal Structure of Aluminium. P. Scherrer 381
„ „ of Alums and Rôle of Water of Crystallisation. L. Vegard and H. Schjelderup..... 681
„ Structure, *see also* section Molecular Physics.
Emission, Light, in Positive Layer, Ionisation with Reference to. O. Hardtke 1161
Equilibrium Temperature of Body exposed to Radiation. C. Fabry 83
Grey Radiation, Criteria for. P. D. Foote..... 178
High-frequency Spectra with Cylindrical Laminæ of Rock-salt. R[ita] Brunetti 159
Irregular Assemblages of Pulses and their Actions on Resonators. T. Terada 158
Isotopes, Spectra of, and Vibration of Electrons in Atom. W. D. Harkins and L. Aronberg 271
Kathode Rays, Effect of Magnetic Field upon. L. T. More and L. M. Alexander 1116
„ Rays, Origin of. E. Meyer and H. Schüler..... 1265
Light Sources, Radiation. Efficiencies of. F. Conrad..... 670
Palladium Antikathode, Absorption of Radiation emitted by, in Rhodium, Palladium, and Silver. E. A. Owen 682
Penetrating Radiation on Obir, Observations of. V. F. Hess and M. Kofler 274
Phosphorescence, *see* separate section.
Planck Radiation Constant C_2, Determination of. C. E. Mendenhall 86
„ „ Law, Assumptions underlying Proof of. F. R. v. Bichowsky..... 387

For the **Explanation** of this Index see p. 535.

Rays and Radiation, *continued.* ARTICLE No.

Radiation Problems in Theory of. A. Schuster ..... 5[illegible]
Radio-activity see separate section.
Residual Rays, Longer Frequency of. H. S. Allen ..... 5[illegible]
Resonance and Ionisation Potentials for Sodium Vapour. J. T. Tate and P. D. Foote ..... 5[illegible]
Resonance Radiation, see section Spectra.
Röntgen Ray Interference and Mixed Crystals. M. v. Laue ..... 1[illegible]
" -ray Spectrum of Gadolin, K-Series of. H. S. Uhler and C. D. Cooksey ..... 5[illegible]
" Rays, Spectrography of. de Broglie ..... 5[illegible]
Secondary Radiation from Plate, Calculation of. R. Glocker ..... 5[illegible]
" " , New, at Positive Rays. M. Wolfke ..... 5[illegible]
" " , Penetrating, produced by Canal-rays. M. Wolfke ..... 5[illegible]
Spectrum of Rotating Molecule according to Theory of Quanta. J. M. Burgers ..... 5[illegible]
Temperature Radiation, Electron Theory of. H. Nagaoka ..... 5[illegible]
Tungsten, Emissive Power of, at Incandescent Temperatures. A. G. Worthing ..... 5[illegible]
Uniformly Heated Enclosure, Coefficient of Total Radiation of. W. W. Coblentz ..... 5[illegible]
X-radiation, General and Atomic Number of Target, Relation between. W. Duane and F. Shimizu ..... 1[illegible]
" , Scattered, in Crystalline Reflection of X-rays. H. Faxén ..... 5[illegible]
X-ray Absorption Phenomena. M. de Broglie ..... 5[illegible]
" Analysis, Geometry of Image Formation in. H. S. Uhler ..... 5[illegible]
" Crystal Analysis, New Method of. A. W. Hull ..... 5[illegible]
" Penetration, Depth of Effective Plane in. F. C. Blake ..... 1[illegible]
" Emission Characteristics as Function of Applied Voltage. S. Davis ..... 5[illegible]
" Examination of Crystal Structure of Cleiocyanite. C. L. Burdick and J. P. Ellis ..... 5[illegible]
" Frequencies, Critical Absorption and Characteristic Emission at. W. Duane and K. F. Hu ..... 5[illegible]
" Frequencies, Maximum Emission Velocity of Photo-electrons from Metals at. K. F. Hu ..... 1[illegible]
" Series, K and Atomic Numbers, Relation between. W. Duane and K. F. Hu ..... 1[illegible]
" Spectra. J. Beeman ..... 1[illegible]
" " and Constitution of Atom. L. Wegrad ..... 5[illegible]
" " of Isotope Elements. M. Siegbahn and W. Stenström ..... 5[illegible]
" " , Atomic Structure and. T. A. Sommerfeld ..... 5[illegible]
" " , Continuous, of Certain Elements, Energy in. C. T. Ulrey ..... 1[illegible]
" Spectrogram, Debye-Scherrer. Evaluation of. A. Johnsen and O. Tangen ..... 5[illegible]
" Spectroscopy. E. Wagner ..... 5[illegible]
" Spectrum of Gallium and Grating Space of Calcite. A. H. Compton, H. S. Uhler ..... 5[illegible]
" Spectrum of Pt and Ir, Photographic Analysis of. J. E. Lilienfeld and H. Seemann ..... 1[illegible]
" Spectrum, Continuous. J. E. Lilienfeld ..... 5[illegible]
" " " " , Limit of. A. Müller ..... 5[illegible]
" " , Tungsten, and Resolving Powers of X-ray Spectrometers. E. Dershem ..... 5[illegible]
X-rays and Theory of Radiation. C. G. Barkla ..... 5[illegible]
" , Absorption and Scattering of, and Characteristic Radiations of J-Series. C. G. Barkla and M[argaret] P. White ..... 5[illegible]
" , Absorption of. E. A. Owen ..... 5[illegible]
" " of, in Copper and Aluminium. C. M. Williams ..... 1[illegible]
" " Laws for. R. Glocker ..... 5[illegible]

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Solution and Solubility, *continued.*
Radium Sulphate, Solubility of. S. C. Lind, J. E. Underwood, and C. F. Whittemore 534
Specific Volume, Apparent, in Solution. Le R. D. Weld and J. C. Steinberg 209
Viscosity, *see also* separate section.

Sound.
Aerial Waves Generated by Impact. II. S. Banerji 781
Atmosphere, Acoustics of. E. Schrödinger 181
Beats. E. Waetzmann 858
Coupled Circuits, Action of, and Mechanical Analogies. H. C. Plummer 138
Energy Absorption in Sound Receivers of First Order. H. Lichte... 391
Explosions, Powerful, and Gunfire, Abnormal Sound Radiation from. F. Nölke 183
High-explosive Sounds. Marage 394
Melde's Experiment. A. T. Jones and M. E[veline] Phelps..... 392
„ „ , Rotation of Pulley in. A. T. Jones 857
Oscillating Systems damped by Resistance as Square of Velocity. J. P. Van Zandt..... 137
Pipes, Pitches of, with Changes of Cross-section. P. Cermak 182
Propagation of Sound and Light in Irregular Atmosphere. Rayleigh 861
Recognition of Sound, Number of Vibrations necessary for. A. Stefanini 179
Resonance of Sounding Bodies. G. Sizes 393
Screen against Sound and Vibrations. R. Ottenstein 180
Sound Ranging, Mathematical Theory of. H. Bateman..... 856
Strings, Forced Vibrations of. A. Lampa 782
Transmission of Sound through Earth and Rock. L. V. King and A. N. Shaw 862
Variation of Velocity of Waves due to Motion of Source. D. Alter... 1146
Vibrations, Variably-coupled. II. Unequal Masses or Periods. E. H. Barton and H. M[ary] Browning 335
„ , Variably-coupled. III. Both Masses and Periods Unequal. E. H. Barton and H. M[ary] Browning..... 894
Vowels, Composition of. C. Stumpf 783
Wolf-note in Bowed Instruments. C. V. Raman..... 859
„ in Pizzicato Playing. C. V. Raman..... 860

Specific Heat and Latent Heat.
Heat Capacity of Electro-positive Metals and Thermal Energy of Free Electrons. G. N. Lewis, E. D. Eastman, and W. H. Rodebush 540
Latent Heat of Fusion as Energy of Molecular Rotations. K. Honda 1261
„ „ of Vaporisation of Ammonia. N. S. Osborne and M. S. Van Dusen 278
Specific Heat of Hydrogen, New Formula for Temperature Variation of. E. C. Kemble..... 539
„ Heat of Liquid Hydrogen, Measurements of. Heat of Fusion of Hydrogen. W. H. Keesom and H. K. Onnes..... 960
„ Heat of Liquid Ammonia. N. S. Osborne and M. S. Van Dusen 277
„ Heats of Hydrogen, Ratio of, at 18° C. and — 190° C. M[argaret] C. Shields 175
„ Heats of Lead-Antimony Alloys. R. Durrer 689

Spectra.
Absorption, Optical. P. Debye 496
Ammonia, Ultra-violet Band of, and its Occurrence in Solar Spectrum. A. Fowler and C. C. L. Gregory 937
Band Series, Mathematical Structure of. II. R. T. Birge..... 525
„ Spectra, Perturbations in Series Lines of. T. Heurlinger 1091
Bismuth Line λ4722, Structure of. L. Aronberg 676
Boron, Spectrum of. A. de Gramont 679

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Spectra, *continued.*
Cadmium Vapour, Resonance and Ionisation Potentials for. J. T. Tate and P. D. Foote 941
Ca, Sr, Ba, and Mg, Variation with Temperature of Electric Furnace Spectra of. A. S. King 1158
Cd, Zn, and K Vapours, Resonance and Ionisation Potentials for. J. T. Tate and P. D. Foote 378
D-lines, Ratio of Intensities of. V. Voss 371
Electric Field, Action of, on Spectrum Lines, *see* section Zeeman-effect.
Europium, Arc Spectrum of, and of New Element between Europium Samarium. J. M. Eder 677
Grating, Concave, with Large Ruled Spacing, Correction Terms for. H. Nagaoka 263
Helium Series, New. G. Liebert 1254
„ , New Principal Series of. VIII. J. Stark 1252
High-frequency Spectra, *see* section Rays.
Holmium, Separation of. Observations on Rare Earths. VII. L. F. Yntema and B. S. Hopkins 1198
Hydrogen Spectrum, Bohr's Theory of. J. Stark 522
„ : Rotation Spectrum of a Gas. G. Hettner 935
„ , Spectral Series of, and "Astronomical Atom." F. Sanford 1250
Infra-red Radiation, Absorption of, by Water-vapour. W. W. Sleator 1150
Iodine, Band and Line Spectra of. R. W. Wood and M. Kimura ... 65
„ , Resonance Spectra of. R. W. Wood 375
Iron Arc free from Pole-effect for Wave-length Standards. C. E. St. John and H. D. Babcock 64
„ , Cobalt, and Nickel Arcs, Red and Infra-red Spectra of. W. F. Meggers and C. C. Kiess 1160
„ , Flame and Furnace Spectra of. G. A. Hemsalech 1159
Lead, Spectroscopic Estimation of Small Amounts of, in Copper. C. W. Hill and G. P. Luckey 1126
„ , Spectrum of Isotopes of. L. Aronberg 678
Lightning, Spectrum of. J. B. Cannon 680
Li, Rb, Cs, and Au, Quantitative Spectra of. A. G. G. Leonard and P. Whelan 524
Mercury Line λ2536, Structure of. L[ucy] Wilson 369
Meteorites, Photographic Spectra of. W. Crookes 489
Neon, Spectrum of. K. W. Meissner 265
Nickel, Spectrum of. J. E. Paulson 372
Nitrates, Natural Frequencies of, in Infra-red. C. Schaefer and [Miss] M. Schubert 940
Nitrogen Spectrum. O. Hardtke 1092
Ozone, Atmospheric, Absorption Bands of, in Spectra of Sun and Stars. A. Fowler and R. J. Strutt 12
Resonance Radiation and Quantum Theory. T. K. Chinmayam 160
„ Spectra, Series Law of. R. W. Wood and M. Kimura ... 376
Reversal of Spectrum Lines produced by Spark under Water. T. Mashimo 938
Rock-salt, Residual Rays of. H. P. Hollnagel 515
Röntgen Rays, Wave-lengths of, *see* section Rays.
Rotating Molecule, Spectrum of, according to Theory of Quanta. J. M. Burgers 286
Series Spectra, Intensity Distribution in. J. Holtsmark 838
„ , Spectral, Origin of. H. S. Allen 523
Single-lined Spectra and Ionisation. H. J. van der Bijl 161
Sodium Vapour, Resonance and Ionisation Potentials for. J. T. Tate and P. D. Foote 63
„ Vapour, Resonance Radiation of, excited by One of the D-lines. R. W. Wood and F. L. Mohler 374
Solar Spectrum, *see* section Astronomy.

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Spectra, *continued.*
Spectral Intensities, Photographic Method of Determining. G. Holst and L. Hamburger 778
Spectroscopic Apparatus, *see* section Apparatus.
Stark-effect, *see* section Zeeman-effect.
Stellar Spectra, *see* section Astronomy.
Titanium, Spectrum of. A. de Gramont..... 370
Transmission of Various Substances Spectroradiometric Investigation of. W. W. Coblentz, W. B. Emerson, and M. B. Long... 1149
Uranyl Salts, Absorption Bands in Spectra of. H. L. Howes..... 373, 526
Water-vapour Band λ3064 and Solar Spectrum. A. Fowler 936
„ „ , Infra-red Absorption Spectrum of. G. Hettner 939
Wave-length Measurements in Spectra from 5600 to 9600 A.U. W. F. Meggers..... 777
X-ray Spectra, *see* section Rays.
Zeeman-effect, *see* separate section.

Static and Atmospheric Electricity, *see also* sections Discharge and Radio-activity.
Atmosphere, Origin of Increase of Ionisation of, with Height. A. Gockel..... 701
Atmospheric Electrical Potential, Diurnal Variation of. A. B. Chauveau 190
„ Electricity, Measurements of, on Teneriffe. W. Buchheim and H. Dember 189
Charges, Electric, on Spherules of Sulphur and Mercury. I[rene] Parankiewicz 188
Conducting Spheres, Two, Coefficients of Potential of. A. Anderson 399
Conductors, Three Electrified Spherical, Problem of. A. Anderson 698
Contact Electricity, *see* section Batteries, Primary.
Electrification by Friction. J. A. McClelland and C. J. Power 700
Ions produced by bubbling Air through Alcohol. J. A. McClelland and P. J. Nolan 1182, 1264
Lightning-flashes, Investigation of. B. Walter..... 1115
Penetrating Radiation, Earth's, *see* section Rays.
Point-potential Expansions. A. W. Conway..... 1113
Raindrops, Negatively Electrified, Formation of. F. Sanford..... 1183
Rectangular Plate, Thick, Charged at its Centre. Mesnager 91
Sphere, Conducting, in Spherical Cavity, Electrostatics of. A. Russell..... 699
Spraying of Water, Ions produced by. J. J. Nolan..... 294
Tribo-electricity, Experiments on. I. Tribo-electric Series. P. E. Shaw 92

Surface Tension.
Capillary Layer of Liquid in Contact with its Saturated Vapour, Thickness and Structure of. G. Bakker 613
Drops, Fall of, in Viscous Media, *see* section Viscosity.
Oil Films on Water. G. Ercolini..... 1210
Rupture of Liquids between Rolling Sphere and Plane Plate. M. Toepler 1016
Surface Tension and Angle of Contact of Mercury. R. Fürth..... 618

Temperature.
Grey Radiation, Criteria for. P. D. Foote..... 178
High-temperature Scales, Comparison of. E. P. Hyde and W. E. Forsythe..... 541
Platinum and Gold-resistance Thermometers, Comparison of, with Helium Thermometer. P. G. Cath, H. K. Onnes, and J. M. Burgers 961
Temperature Scales, *see also* section Thermometry.
Tungsten and Carbon, Colour Temperature Scales for. E. P. Hyde, F. E. Cady, and W. E. Forsythe 73

Temperatures, High and Low.
Catathermic Phenomena at 1000° C. J. A. Le Bel 1079

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Temperatures, High and Low, *continued.*
High Temperatures, Thermal Expansion of Steels at. K. Honda ... 538
Hydrogen, Liquid, Viscosity of. J. E. Verschaffelt 965
„ , Vapour Pressures of, in Neighbourhood of Boiling-point. P. G. Cath and H. K. Onnes 957
Incandescent Temperatures, Thermal Expansion of Tungsten at. A. G. Worthing 276
Liquid Hydrogen, Specific Heat of. W. H. Keesom and H. K. Onnes 960
Low Temperatures, Electrical Conduction in Metals at. F. B. Silsbee 1187
Measurements, *see* separate section.
Neon, Vapour Pressures of, between Boiling-point and Critical Point. P. G. Cath and H. K. Onnes 959

Terrestrial Magnetism and Electricity.
Atmospheric Electricity, *see* section Static Electricity.
Declination, Magnetic, at Zi-Ka-Wei, Influence of Lunar Declination on. S. Chapman 115
Do Forces causing Diurnal Variation of Magnetism Possess a Potential? [Miss] A. van Vleuten 569
Earth-current Measurements, Pressure and Temperature Effects in. S. J. Mauchly 992
Earth's Magnetism, Diurnal Changes of. S. Chapman 567
„ „ , Measurement of Horizontal Intensity of. C. Dieterici 114
Horizontal Intensity Determinations with Dieterici Magnetometer. M. Reinhold 707
Magnetic Storm, Faculæ, and Sunspots. H. Arctowski 201
Magnetograph Records at Theodosia during Solar Eclipse, 1914. L. Palazzo 873
Meteorology, *see* separate section.
Pulsations, Magnetic, at Zi-Ka-Wei and Lu-Kia-Pang. J. de Moidrey 116
Storm, Magnetic, and Aurora, Dec. 16–17, 1917. C. Chree 306
„ , „ , „ of March 7–8, 1918 354
„ , „ , of Dec. 16–17, 1917, as recorded at Kew and Eskdalemuir Observatories. C. Chree 1195
Storms, Magnetic, Sudden Commencement of. S. Chapman 993
Survey, Magnetic, of New Zealand. C. C. Farr 570
Terrestrial Magnetic Field, Internal, Dependence of, on Induced Currents. [Miss] A. van Vleuten 568
Terrestrial Magnetic Variation, Diurnal Motion of. A. Schmidt 1194

Terrestrial Physics.
Atmosphere, Lower, U.V. Transparency of, and its Poverty in Ozone. R. J. Strutt 466
Atoll, Jaluit, Determination of Second Derivatives of Gravitational Potential on. M. Matsuyama 917
Borings, Temperature Measurement in. Verzat 1042
Coral-reef Problem and Evidence of Funafuti Borings. E. W. Skeats 241
Deep-sea Surface, Oscillations of, caused by Local Disturbance. K. Terazawa 468
Deformation, Terrestrial, by Tidal Forces, Theory of. W. Schweydar 829
Denudation by Rain Run-off. H. Jeffreys 1040
Drift of "Endurance." J. M. Wordie 1148
Earthquake Frequency. R. D. Oldham 629
Earthquakes, Dardanelles, Autumn, 1912. M. Yélénko 916
„ , Near, "Laufzeitkurve" for. S. Nakamura 346
Earth's Interior, Limiting Strength of Rocks in. L. V. King 345
Epicentres, Location of, for 1916. E. A. Hodgson 1043
Eruption, Katmai, in 1912. R. F. Griggs 1041
„ of Volcano Quetzaltepeque and Earthquake of San Salvador. A. Lacroix 240

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Terrestrial Physics, *continued.*
Glaciers, Pressure of Air-bubbles in. P. L. Mercanton 145
Glass-making, Significance of, to the Petrologist. N. L. Bowen 467
Ground-water Movements according to Isothermal Curve Systems. P. Forchheimer 628
International Torsions and Recurrent Tetrahedral Deformations. B. K. Emerson 222
Latitude Variation, Nature of "z" term in. I. Yamamoto 1037
„ , „ of. F. W. Dyson 1038
Microseismic Movement, Annual Period of. O. Meissner 469
Mixed Liquids, Properties of. III and IV. Law of Mixtures. I. J. L. R. Morgan and M[ary] A. Griggs, A. J. Scarlett, Jr. 436
Nitrogen, Chlorine, and Sulphates in Rain and Snow. E. L. Peck... 239
Oxygen, Dissolved, Vertical Distribution of, and Precipitation by Salt Water. J. W. Sale and W. W. Skinner 238
Seismograms, Mechanical Evaluation of. W. Schmidt 627
Submarine Faults, Locating. O. Klotz 630
Tidal Energy Dissipation. R. O. Street, H. Jeffreys 9
Tides, Neighbouring Oceanic, Periodic Disturbance of Level from Load of. K. Terazawa 146
Vibration of Tall Chimneys. Omori 1039
Volcanic Islands, Isostatic Subsidence of. W. M. Davies..... 10
Water-level, Diurnal Variations of, in Well at Kew. E. G. Bilham 918

Thermodynamics, *see also* section Gases.
Adiabatic Hypothesis and Boltzmann Principle. A. Smekal 854
„ Invariants of Mechanical Systems. J. M. Burgers 284
Boltzmann Principle, On most probable Distribution to be employed for Proof of. A. Smekal..... 388
Carnot's Principle, Thermodynamics based entirely upon. Second Absolute Temperature. C. Raveau..... 1178
Characteristic Equations of Fluid. P. Weiss 1176
Chemical Equilibrium, *see also* separate section.
Clausius Equation of State, Necessity of Amending. E. Ariès 390
Entropy Diagram for Petrol. J. Rey 543
„ of Elements and Third Law of Thermodynamics. G. N. Lewis and G. E. Gibson 177
„ of Metal. H. S. Allen 962
„ , Physical Interpretation of. J. Lahousse 289
Equation of State of Associating Substance. J. E. Verschaffelt 389
„ „ , Influence of Finite Volume of Molecules on. M. N. Shaha and S. N. Basu 1173
Equilibrium Temperature of Body exposed to Radiation. C. Fabry 83
Functional Determinant, Theoretical, of Gas and its Geometrical Significance, Simple Calculation for. H. Rothe 84
Gaseous Equilibria, Contribution to Determination of. W. D. Treadwell 81
Heat, Nature of, as directly deducible from Postulate of Carnot. J. Larmor 695
Joule-Thomson Effect and Equation of State for Gases at Small Pressures. M. Jakob 960
Kinetic Theory and Definiteness of Macroscopic Processes. [Mrs.] T. Ehrenfest-Afanassjewa 855
„ Theory of Rigid Molecules. Y. Ishida 80
Least Work of Change of Configuration. K. Federhofer 287
Monatomic Liquid, Formula for Tension of Saturated Vapour of. E. Ariès 545
Nernst Theory of Heat. P. S. Epstein 79
Phase-space of partially Periodic System, Structure of. P. S. Epstein 968
Planck Radiation Constant C_2, Determination of. C. E. Mendenhall 80
Potentials, Thermodynamic, Proof of Assumptions Underlying. M. B. Weinstein 967

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Thermodynamics, *continued.*
Quanta Theory, Remarks on Statistical Foundations of. L. Flamm 851
Quantum Theory and Energy Partition. R. C. Tolman..... 852
Rotating Molecule, Spectrum of, according to Theory of Quanta. J. M. Burgers 286
Springs, Thermodynamics of. H. Bock..... 1107
Stefan-Boltzmann Law, Constant σ in. M[arya] Kahanowicz 288
Thomson-Joule Effect for Air, Dependence of, on Pressure and Temperature. F. Noell 544
Throttle-valve, Thermodynamics of. M. Jakob 85
Wien's Distribution Law, Wood's Criticism of. H. Jeffreys..... 694

Thermo-Electricity and Thermo-Magnetism.
Bismuth-Tin Alloys, Thermoelectric Powers of. A. E. Caswell and C. A. McKay 1274
Bismuth, Electrical Properties of, in and out of Magnetic Field. G. Borelius and A. E. Lindh 107
Calcium, Thermoelectric Power of. C. L. Swisher..... 299
Diagrams, Thermoelectric, on the P-V Plane. E. H. Hall 704
Fused Metals, Thermoelectric Properties of. C. R. Darling and A. W. Grace 301
Iron Oxide, Electrical and Thermal Properties of. C. C. Bidwell... 300
Measurements, *see* separate section.
Mercury, Thermoelectric Effect in, due to Asymmetric Heating. C. Benedicks 106
Peltier and Volta Effects in Thermo-Electricity, Relation between. E. H. Hall 403
Thermoelectric Action with Dual Conduction of Electricity. E. H. Hall 868
Thermoelectric Force, Peltier Heat, and Thomson Heat under Pressure. P. W. Bridgman 558
Thermoelectric Properties as Method of Analysis for Mixed Crystal Alloys. G. Borelius..... 430
Thermo-Electricity, Fundamental Effect connected with. C. Benedicks 984
Thermomagnetic Phenomenon, New. P. Weiss and A. Piccard ... 991
Thomson-effect in Bismuth-Tin Alloys. A. E. Caswell..... 1275
„ , Verification of Thomson Theory of Thermoelectric Circuit and Method of measuring. G. Borelius 1188

Thermometry, Pyrometry, and Calorimetry.
Adiabatic Calorimetry, Direct, at High Temperatures. A. Perrier... 1170
Calorimeter Design and Thermal Leakage. W. P. White 537
Colour Temperature Scales for Tungsten and Carbon. E. P. Hyde, F. E. Cady, and W. E. Forsythe 73
Eutectic Alloys, Temperature Determinations by. C. P. Steinmetz 280
Fixed Points in Thermometry: Transition Temperatures of Strontium Chloride and Strontium Bromide. T. W. Richards and V. Yngve 313
High-temperature Scales, Comparison of. E. P. Hyde and W. E. Forsythe..... 541
Normal Temperature, Pure, or Normal Temperature and Standard Temperature. F. Plato 958
Platinum and Gold-resistance Thermometers, Comparison of, with Helium Thermometer. P. G. Cath, H. K. Onnes, and J. M. Burgers 961
Pyrometers, Optical, Absorption Glass for. P. D. Foote, F. L. Mohler, and C. O. Fairchild 60
Sodium Sulphate, Solubility of, as Means of determining Temperatures. T. W. Richards and V. Yngve 279
True Temperature Scale for Tungsten. A. G. Worthing 74

Vapour Pressure.
Ammonia, Liquid, Vapour Pressure of, up to Critical Temperature. II. F. G. Keyes and R. B. Brownlee..... 282

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Vapour Pressure, *continued.*
Bodies with High Atomicity, Saturated Vapour Tensions of. E. Ariès 1177
Diatomic Liquid, Formula for Tension of Saturated Vapour of. E. Ariès 692
„ Liquids, Anomalies presented by Saturated Vapour Tensions of. E. Ariès 693
Hydrogen, Vapour Pressures of, in Neighbourhood of Boiling-point. P. C. Cath and H. K. Onnes 957
Monatomic Liquid, Formula for Tension of Saturated Vapour of. E. Ariès 545
Neon, Vapour Pressures of, between Boiling-point and Critical Point. P. G. Cath and H. K. Onnes 959
Octo-atomic Bodies, Saturated Vapour Tensions of. E. Ariès..... 1174
Pentatomic Bodies, Saturated Vapour Tensions of. E. Ariès... 1175
Relation between Vapour Pressures and their Corresponding Temperatures, Determination of. W. R. Ham, J. C. Churchill, and H. M. Ryder..... 963
Tetratomic Bodies, Saturated Vapour-tensions of. E. Ariès 964
Triatomic Liquids, Tensions of Saturated Vapours of. E. Ariès..... 853
Vapour Pressure. P. E. Brunelli..... 385

Viscosity.
Lubricating and other Properties of Thin Oily Films. Rayleigh ... 330
Lubrication Theory of. Rayleigh 329
Measurements, *see* separate section.
Rupture of Liquids between Rolling Sphere and Plane Plate. M. Toepler 1016

Vision.
Brightness and Colour, Errors affecting Visual Estimations of. H. Osthoff 24
Colourless Sensation, Fourth, in Three-sensation Spectrum. W. de W. Abney, S. W. J. Smith 156
Colours, Mixed, Resolution of, by Differential Visual Diffusivity. H. E. Ives 669
Colour Spectra, Appearance of, to Aged. R. B. Carter..... 55
Diplopia, Prism Binoculars for detecting. A. Blondel 1240
Luminous Impressions, Persistence of, on Retina. L. Lumière 928
Minimum Radiation Visually Perceptible. P. Reeves 49
„ „ „ „ . H. Buisson 359
Night-blindness, Congenital, Two Cases of. W. de W. Abney 674
Pupillary Area and Retina of Eye, Effect of Light on. P. Reeves..... 157
Radiation, Visibility of. P. Reeves..... 668
„ , „ . E. P. Hyde, W. E. Forsythe, and F. E. Cady 929
„ , Visibility of, in Blue End of Visible Spectrum. L. W. Hartman 666
Retina, Brightness Sensibility of. J. Blanchard 667
Retinal Threshold, Effect of Size of Stimulus and Exposure-time on. P. Reeves 1244
Sensation of Light, Minimum Energy necessary to Produce. H. Buisson 1243
Sensibility of Average Eye to Light of Different Colours. W. W. Coblentz and W. B. Emerson 155
Visibility Function, Law of Symmetry of. I. G. Priest 1245

Zeeman-effect and Radiation in Magnetic and Electric Fields.
Helium Lines, Electrical Resolution and Broadening of. T. R. Merton 1157
Iodine, Zeeman-effect for Complex Lines of. R. W. Wood and M. Kimura 66
Magnetic Rotatory Polarisation, *see* section Polarisation.
Stark-effect. VII. J. Stark, O. Hardtke, and G. Liebert 1251

For the **Explanation** of this Index see p. 535.

Abstract Nos.

Zeeman-effect and Radiation in Magnetic and Electric Fields, *continued.*

Stark effect for Argon Line. T. Takamine and N. Kokubu 1094
" " Helium Lines. T. Takamine and N. Kokubu 942
" " " . T. Takamine and U. Yoshida..... 840
" " Hydrogen Lines. S. Nitta 841
" " " . II. T. Takamine and U. Yoshida 839
" " Ultra-violet Lines of Helium. G. Liebert 1253
" in Helium and Hydrogen. T. Takamine and N. Kokubu 1093

For the **Explanation** of this Index see p. 535.

The Gresham Press
UNWIN BROTHERS, LIMITED
WOKING AND LONDON